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BETTER FRUIT

VOLUME IX NOVEMBER, 1914 NUMBER 5

IN THE NORTHWEST THE RAILROADS WORK IN CONJUNCTION WITH THE AGRICULTURAL COLLEGES TO EDUCATE THE FRUIT GROWERS AND FARMERS TO PRODUCE LARGER AND BETTER CROPS. INASMUCH AS ALL FARMERS CANNOT ATTEND AGRICULTURAL COLLEGES OR TAKE SHORT COURSES, THE AGRICULTURAL COLLEGES GO TO THE FARMER WITH DEMONSTRATION TRAINS, VISITING EVERY SECTION IN THE NORTHWEST. THE ABOVE SCENE ILLUSTRATES A DEMONSTRATION TRAIN OF THE OREGON-WASHINGTON RAILROAD & NAVIGATION COMPANY FILLED WITH EXHIBITS AND CARRYING A STAFF OF LECTURERS FROM THE OREGON AGRICULTURAL COLLEGE.

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BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Size, Color and Quality in Fruit

By Professor U. P. Hedrick, State Experiment Station, Geneva, New York

APPRECIATION of fruits comes through three of the five senses—taste, sight and smell, though the last is of little importance, being so intimately connected with taste as to be almost a part of it. This leaves taste and sight as the senses by which fruits are judged. We grow fruit to eat, and it would seem therefore that taste should set the seal of approval. Connoisseurs do judge fruit by the sense of taste, but the public, in this as in many other matters, does not march with the connoisseurs, and the average person, personification of the public, uses the eye more than the tongue in measuring the merits of fruits. This difference between professional and popular judgment comes about because of a very general misconception of the relative values of size, color and quality in fruit—a misconception which furnishes my excuse for calling your attention, in a popular way, to what I conceive to be the comparative value of size, color and quality in fruit and for a very discursive consideration of how these attributes may be modified by culture.

When the nurseryman sets his net, in the shape of an illustrated catalog, for the fruitgrower, he baits it with gorgeous illustrations showing fruits of heroic proportions. The most frequent descriptive phrase accompanying this alluring bait is "of largest size." In his turn the fruitgrower usually makes an exhibit, or a sale of his wares, with the apologetic yarn that he kept the largest for his own use, or he had larger last year, or he could grow bigger ones if he were so disposed. All this shows a craving after size—a craving that has been bred and is now stimulated by competitive exhibitions in which size is usually given first place. This has gone on for so long that now size is generally esteemed about the highest quality a fruit may possess. This feeling finds expression many times and in many ways at every fruit exhibit to which the public has access. What are the true merits of size in fruits?

In fruits for the kitchen, fair or large size is distinctly meritorious, saving waste in paring and coring or pitting, though even here there are exceptions, for one does not want a huge baked apple, a mammoth peach for canning, nor large plums for preserving. But for all dessert purposes the medium-sized fruit should be preferred and the Fameuse or the little Lady apple, a Seckel or Doyenne pear, a Crawford peach and a Green Gage plum are, or should be, as acceptable as any varieties of their kinds. Certainly no one wants to make two bites at a cherry, strawberry or any of the small fruits. Large size in fruit is often poor economy, whether on the fruit sand, in the hotel or for the home, for a small or medium fruit frequently answers the same purpose that a larger one would.

Not always, but often, undue size in any variety is accompanied by inferior quality. This is especialy true if size has been brought about by much water, in which case the fruit may actually be said to be bloated. The highly-flavored solids of the normally-grown fruit are diluted or adulterated with water. So, too, extra large specimens of tree or small fruits in which size is attained by high feeding or by such abnormal practices as ringing, usually lack in quality. From all this we must conclude that while a good large fruit may be better than a good small fruit, yet if in the large fruit there is a falling off in quality it at once loses value. It is true, however, that some of the varieties of our tree fruits might be increased in size to advantage, and the value of many grapes and small fruits would be much enhanced by greater size. Thus it becomes a matter of importance to know how to increase the size of fruits, should we so desire. The task is not difficult. Generally speaking, whatever increases tree growth gives greater size in the product. To be specific, the application of nitrogenous fertilizers, plowing under leguminuous cover crops, frequent and long-continued cultivation, these acting singly or associatively will increase the size of fruits. Another way of attaining greater size is by restricting the top of the plant by heavy pruning, thus getting greater growth in the parts that remain. Lastly, most commonly and best means of all, the size of almost all fruits can be greatly increased by judicious thinning, an orchard operation so generally used that it needs no further discussion here.

The comparative value of color and quality in fruits is a subject of never-ending discussion. We can all agree that both are necessary in first-class market fruits, but often a choice must be made between the two. Which then? To my mind there should be no question about the supremacy of quality over color, but consumers discriminate in favor of bright colors. Thus, red apples are preferred to yellow, green and russet varieties—the latter, side by side with red sorts no better in quality, go begging for buyers. Fruit is bought to eat. What a paradox to buy that which is hardly fit to eat because it is brilliantly colored. This unjust discrimination comes about because red is more attractive to the eye of most people and because of a very general misconception that color is correlated with quality. Red apples have thus become the fashion with consumers and must, therefore, be produced by growers. Are brilliantly-colored apples of better quality than those of subdued hues?

Some say that high quality goes with high color—that is, with bright reds, crimsons or scarlets, or in patterns striped with these colors; others say "handsome but poor," indicating a belief in a correlation of high quality and low color. But a consideration of varieties shows at once that there are no correlations between color and quality. The hungry man who knows apples will say grace with just as much unction over a Green Newtown, a Golden Russet or a Grimes Golden as over a red Jonathan, a Spitzenberg or a McIntosh. Coming to individuals in a variety, it is found that apples grown in sod are brilliantly colored; those grown under tillage are of more sombre hues. Nine out of ten people will choose the highly-colored sod-grown fruit as the best flavored, but it needs only a taste to convince to the contrary. The tilled fruit is crisper, juicier and richer. On the other hand, poorly colored apples in the center of a tree are often less well flavored than the brighter fruits exposed to the sun. There are many just such seeming correlations between color and quality, but a careful study of all shows that there are no real relations between color and quality.

Just now the fashion is for red apples. But fashions in colors of fruits

Features of this Issue

change as fashions in colors of clothes, or hats or ties, change. At one time russet apples were in great demand—not so now. In some markets Green Newtowns or Yellow Belleflowers or Rhode Island Greenings are still preferred. The present tendency to plant nothing but red apples is bound to make them less the fashion in time and to give greater demand for green, yellow and russet fruits. That color is quite unrelated to permanent value is proved by these changes and variations in fashion. The point I am seeking to make is, that we are following a prejudice in rating one color above another regardless of quality. This prejudice is detrimental to fruit growing and fruitgrowers should seek to overcome it by calling attention to the good qualities of apples regardless of color. "Plumage proclaims the fowl" but color does not proclaim the fruit. We are all well agreed, however, that it is very desirable to put a variety on the market in its own distinctive color, provided too much is not sacrificed in securing characteristic color. How may the color of varieties be kept normal, true and distinctive?

It is impossible to discuss color intelligently unless we know what color is. What makes the gold of the Pippin, or the red of the Spitzenberg? To define carefully in this case takes us far afield in organic chemistry, where all but those bred therein are soon hopelessly lost. It is difficult to make even a few simple statements in regard to color without becoming entangled in the jargon of chemistry. But, in brief, some of the colors of fruits are carried in small granules or corpuscles, while others are dissolved in the cell sap. Thus, the green, yellow, orange and some of the red colors are due to the presence of millions of brightly-stained corpuscles in the cells of the skin, while other reds, especially those of a violet cast, are due to stained cell sap. The color-bearing corpuscles are derived from the chlorophyll or leaf-green of the plant; colored sap is largely the result of oxidizing agents acting on certain substances in the fruit.

The oxidizing agents and the substances they act upon are present in green fruits in combination. As the fruits ripen the combination slowly breaks and oxidization takes place. The formation of color corpuscles, too, depends upon the action of oxygen in the presence of light and certain food elements. This is the briefest possible statement of how a very complex process takes place in which the facts to be emphasized are that oxidization goes on as a fruit begins to ripen and that coloring is an indication of ripening, and ceases when the fruit is fully ripe. Now a fruit is rightly ripe only when it is brought to its fullest maturity. But there are no well-marked lines between greenness, maturity and decay. These stages grade insensibly into each other, but coloring, it is well to remember, continues up to the point at which the tissues begin to decay. Shakespeare might have had the ripening and coloring of fruit in mind when he wrote, "And so, from hour to hour, we ripe and ripe, and then, from hour to hour, we rot and rot." Coming as quickly as possible to practical applications of all this, we have at once to call your attention to the fact that the coloring of fruits is largely a chemical process and that chemical processes are profoundly influenced by the conditions under which they take place. Chief of these in influencing color formation in plants are light and heat, but there are others as food or lack of it, moisture, chemicals in the soil and disease.

Every fruitgrower knows that the intensity of color in fruits depends largely on the amount of light. Like the complexion of the dusky Moor, the color of fruit is often "but the burnished rays of the burning sun." Poorly-colored fruits are often due to close planting and density of tree top, whereby sunlight is excluded. Light largely determines the rate and the amount of oxidization that takes place in plant cells, and bright light makes all color-production processes active. The effects of an abundance of light in producing high color are to be seen in top branches, in open-centered trees, in outside and wide-apart rows and in the products of the sunlit states of the West or the high altitudes of any fruit-growing region. Of the few means at the command of the fruitgrower to obtain better color, those having to do with securing more light are most efficient—as pruning, greater distance apart of trees and in selecting sites best exposed to the sun. Not only does light from the sun influence the amount of color in fruit but solar heat has its effect. One who has not given the matter thought immediately jumps to the conclusion that the warmer the weather the brighter the colors, whereas the contrary is usually the case. We found from records of twenty-five harvests in New York that apples usually colored especially well in falls when they ripened in cool weather, more particularly so if the nights were cool and the days bright and sunny. Indeed, saving numerous "just exceptions and reservations," it is not too much to say that rainy weather by lowering the temperature, especially if it alternates with sunshine, may help to give high color to fruit. The effects of low temperature on color may well be seen in Northern climates and high altitudes, where colors are always brighter than in warm climates or low altitudes. The cool nights of the Pacific Northwest are nearly as potent as the sunny days in giving color to the fruits of that region. There is a plausible reason for the effects just ascribed to cool weather in influencing color. The chemical changes which bring about color in fruit accompany the period of ripening. Now ripening marks the cessation of cell activities—comes with the death of cells. In fact, color-pigments may almost be said to be waste products—the "ashes of the vital fires" of cells. Cold hastens the death of the cell, the ripening of the fruit and so increases color. Climate, in the three phases just discussed, light, heat and moisture, greatly modifies the bloom on fruits. The bloom of fruit does not differ from that of poppies, of which the poet says, "You seize the flower, the bloom is shed." Nevertheless it greatly adds to the beauty of the product if present in any considerable amount, and modifies the color favorably despite the absurd practice of rubbing off the bloom practiced by many in exhibiting. Bloom is a valuable asset to fruit and should be increased and preserved.

Nothing is more certain than that the character of the soil influences the color of fruit. Every fruitgrower with any considerable number of trees of one variety must have noticed that the fruit on some trees are better colored than that from other trees. Not infrequently most striking differences can be found in orchards located but a few miles apart. Yet what it is in soils that influences color is not well understood. From the evidence now at hand, it seems that color effects must be due to physical conditions as soil heat, aeration and drainage, all of which would help in causing the crop to mature early and thoroughly. With the single exception of nitrogen none of the baker's dozen of elements made use of by plants under ordinary conditions exercise a decided influence on the color of fruits. The belief is current that orchard products are poorly colored on acid soils and that adding lime will cause them to take on brighter hues, but there seems to be no experimental confirmation of such effects of acid and alkali soils. A half-dozen fertilizer experiments with apples might be cited to show that fertilizers do not favorably affect the colors of this fruit. In particular, the popular generalization that "potash paints fruits," common in the press and reiterated on every page of fertilizer advertising literature, finds no verification in fertilizer experiments with apples. There is a great abundance of observational evidence to show that nitrogen, especially when applied in stable manure and nitrogenous cover crops turned under, causes a lessening of intensity in color. If the position be well taken that color comes with maturity and the death of cells it would be expected that nitrogen would decrease color, since its use generally promotes and prolongs growth and delays maturity of apples. This leads to the statement that usually whatever increases the growth of apples is antagonistic to high coloring. Nothing more strikingly illustrates this than the difference in color and size of apples grown on tilled and sodded land. As every fruitgrower knows, apples grown in sod are smaller, more highly colored and mature earlier than those grown on tilled land. Were it not for the fact that sod culture greatly lowers the productiveness of an orchard, this means of increasing color might be recommended. So, too, apples grown on diseased, girdled, injured or very

old trees are usually smaller and more highly colored than apples from normal plants. Apples are almost always better colored on trees in which the growth is short, stout and firm, and on which the leaves are neither conspicuously abundant or overly luxuriant. A sailor drinking beer from one hand and whisky from the other was asked why he thus mixed his drinks. His reply was that if he drank only whisky he became drunk too soon; if only beer he became full too soon. But when he took a drink of one and then of the other he got just the right proportions of fullness and drunkenness. It seems that the desires of fruitgrowers to have large fruits and well-colored fruits must be satisfied by philosophy similar to that of the sailor. Orchards must be tilled, fertilized and cared for on the one hand to secure size of fruit by promoting growth, while such operations as will reduce size, retard growth and hasten maturity must be practiced to increase color.

What about the influence of other chemicals than those commonly used as fertilizers? Iron, especially in the form of iron sulphate, is supposed to be potent in intensifying the color of fruits. We cannot find the least bit of evidence to prove that such is the case. Orchard soils are so abundantly supplied with iron as a rule that it is like "gilding gold" to add more iron. Neither does there seem to be evidence to confirm the oft-made statement that manganese added to the soil increases color. Some spraying materials no doubt have an influence on the color of apples and pears. This is the experience of all who have carried on comparative tests of any considerable number of spraying materials. Yet so far we have nothing more than generalities as regards the effects of sprays on color. Materials applied as sprays may change the color either by absorbing and so intensifying sunlight, or they may so cover the apple or pear as to protect the fruit from light. These, however, are but surmises. A great many fruit growers are hoping to improve the color of their fruits in new orchards by having young trees propagated from scions taken from trees selected for the high color of their fruit—so-called "pedigreed stock." Once in a very great while strains of varieties having high color do arise and the high color is transmissible, but such cases are exceedingly rare. Differences in color in a variety are practically always fluctuating variations due, as I have tried to show, to climate, soil, tillage, or some stimulation or retardation of growth. Unless, therefore, it is certain that high color in a tree of any variety is transmissible—to be proved only by comparing fruits from trees grown from its scions—it is a waste of time to propagate from bearing trees with the hope of getting better color.

We come now to a discussion of quality. What is quality? The word is rolled under the tongue by both fruitgrowers and consumers alike, but like "good cheer" in the fable, is "fish to one, flesh to another, and fowl to a third." We need, therefore, to define the terms. In brief, quality is that combination of flavor, aroma, juiciness and tender flesh which makes fruits agreeable to the palate, but this is not all. The thing that gives charm to the attractions of the world, whether books, or pictures, or music, or people, or fruits, is that subtle, undefinable thing called personality. A Northern Spy, a McIntosh, a Yellow Newtown, a Seckel pear, a Crawford peach, a Green Gage plum and an Iona grape, for examples, all have distinct and charming personalities which contribute no small part to the high quality of these fruits. But many fruits do not have distinguishable individuality and the sorts named lose it when grown under some conditions. This personality may be quite aside from any tangible qualities. It is akin to the charm of a woman in which the heroine in a current play says, "If a woman has it, she needs nothing else in the world, and if she has it not, nothing else in the world is of any use." A high quality fruit must have a pleasing personality. High quality does not have the commercial value that it should, but it is coming to be worth more and more. There are two kinds of taste, natural taste and acquired taste. Only savages have a natural taste; to them crude, unrefined, tasteless foods answer all purposes. But civilized man has an acquired taste, and with each succeeding stage of civilization it becomes more delicate and more refined. Once they but know where it can be obtained, people will buy and pay for fruits of high quality—fruits with delicate and refined flavors and aromas, and juicy, tender flesh. Such fruits should be the food of the great mass of the American people, while coarse, turnipy fruits should go only to those who cannot tell the difference between a Jonathan and a Ben Davis, a Bartlett and a Kieffer. People need only to be educated as to what varieties are of high quality and a profitable demand will be created. Can the quality of varieties of the different fruits be changed by cultural methods? Possibly somewhat, but not greatly. Generally speaking, whatever care and culture make trees grow and bear normally tend to produce fruits of the highest quality. As I have said before, food and water seem to have decided effects on quality, but what combination of these essentials is best for highest quality is a matter about which we know little. "Paul plants and Appolos waters," but God gives quality. In His distribution of favors He has seen fit to characterize the fruits of some regions by higher quality than those of others, just as He has given large size and handsome color to the products of special regions.

In what has been said I have sought to establish the fact that high quality is the chief of all the attributes of fruit. But there is little use in this discussion if we cannot come to some understanding as to how the condition that prevails can be bettered. To this end a few specific suggestions can be offered:

First—The long suit of the fruitgrower is to grow varieties of high quality. A man should grow sorts for the market that he is willing to eat himself. If individuals make a reputation for the high quality of their fruits a reputation will soon be established for the region and for the fruit.

Second—Let every fruitgrower deprecate above all things the oft-made assertion that the public wants trashy stuff—cares only for appearance and not for quality. It is the fashion of the times to decry the public. Certain papers say the public wants only yellow journalism; some writers hold that the people will read only light or vulgar fiction; rag-time music is supposed to suit the public; theatres will present only sensational plays; following the fashion, fruitgrowers hold that the public has the tooth of a gorilla, the taste of a buzzard, the stomach of an ostrich, and by choice fills its maw on Ben Davis apples and Kieffer pears. It is not true that the public likes poor fruit; the better the fruit the more of it will be eaten. People are slow moving, but once they learn true worth in fruit their appetite will be for the good varieties. They will not be content with poor or mediocre sorts. If the lover of choice viands, and who is not, must wipe the tongue around the mouth and titillate the palate in order to find the flavor of fruits he will take to other delicacies.

Third—It is a good policy not to break rudely with the old but to run smoothly into the new. It would hardly be wise for any man to cut down or graft over certain apples, or pears, or plums, or pull out certain grapes because they are of poor quality. But in the planting of new orchards a man should look well to the quality of the varieties he selects. Speaking broadly, fruits of fine flavor can be grown as easily as the grosser tasting ones. In planting for the future, then, plant for quality.

Fourth—Never in the history of the world have there been so many men directing their efforts toward the improvement of plants. With the recent discoveries in plant breeding and the accumulated knowledge of centuries the efforts that are being put forth are bound to result in many new introductions within the next few years. A man may be pardoned if he clings to some of the mediocre varieties we now have, for these are the elder-born to whom we have become attached in tenderly carrying them through a helpless infancy, but as the physicians and midwives of horticulture bring in the newborn let them be chary of a blessing until their character for high quality is established. Let them be "born to blush unseen," and if christened let them remain in the limbo of the nurseryman's catalog if high quality be not among their accomplishments. Let us raise the standard of excellence by accepting only new fruits which are superior in quality to their predecessors.

Fifth—Nurserymen can do much to encourage the growing of good fruit and to secure the appropriate recognition of high quality. The country is filled with men and women from city, town and country who want to grow fruit for pleasure and profit. When these embryonic fruitgrowers pick the shell and get ready to plant, they go to a nurseryman for trees. Now if the nurseryman will sell all unfledged fruitgrowers varieties of quality rather than what they can spare, fruit growing and, in the long run, the nursery trade will be helped. Some nurserymen hold it to be their inalienable right to substitute when varieties run short. If all such will only slip in a choicely good variety instead of an odd or an end there will be less poor fruit. Nurserymen say they grow the varieties that fruitgrowers want. In reality, however, they very largely force planters to take sorts that grow readily and make good-looking trees in the nursery. Trees for the orchard must be grown in the nursery; trees grown in the nursery must be sold to the fruitgrower; the weal or the woe of the fruitgrower is the weal or the woe of the nurseryman. If tree growers would push the sale of varieties and trees that are truly most useful to the tree planter, nurserymen, fruitgrowers and the public all will be gainers thereby.

Sixth—It should be the business of horticultural societies, one and all, to make the public familiar with the names and the qualities of fruits. With this knowledge fruit buyers would pay the difference between good and poor quality varieties, just as they pay the difference between a porterhouse and a pot stew. Why should they not? There are several ways of reaching the public in this matter. Fruitgrowers and their customers may both gain knowledge of what are the best fruits, and which of them may be grown, by a full and frank discussion of the whole matter at horticultural meetings. County and state fruit organizations ought to do more in the way of making instructive exhibits both at their meetings and at the fairs. In these exhibits much more attention ought to be paid to fancy fruit—high quality fruit. Indeed, it seems certain that higher premiums ought always to be offered for choicely good fruits than for the varieties of poorer quality.

In conclusion: Why discuss this matter? Is it to encourage growing fruit only for a select few who have the cultivated taste? Not by any means. The common taste which falls to with a vigorous appetite upon any fruit presented is now, and must ever be, the chief customer of the fruit grower. But the taste of the multitude should be educated by all possible means for better and better fruits. Why? Because in the long run it means the consumption of a great deal more fruit the country over. Is it reprehensible to grow fruits of poor quality? Possibly not, but it would mean in the course of time the wiping out, root and branch, of the fruit industry if all fruit growers grew poor varieties; besides it would present the vile and sordid spectacle of people deliberately devoting themselves to growing poor fruit when they might as well grow good fruit. Is high quality the only requisite of a good variety? No indeed. There are a score of requisites of fruit and tree that go to make a good variety, but among these quality is not now receiving appropriate recognition, and it is for such recognition that I am pleading. Is this a matter of sentiment or of business? Both. I am not averse to putting some sentiment in fruit growing, but I hope I have not been arguing before a packed jury in trying to convince my readers that it is good business as well as sentiment to grow good fruit.

Dried Fruits An Economical and Valuable Diet

Fresh fruits are divided into two classes, "flavor fruits" and "food fruits," according as they are valued for their flavor or as a food, according to the Office of Nutrition Investigations for the United States Department of Agriculture. Those that are 80 per cent or more water fall under the first classification (apples, pears, peaches and most of our common fruits), while those containing less fall under the latter (bananas, grapes and figs). The food value of a pound of dried fruit is, of course, much greater than that of a pound of fresh fruit. A pound of the latter will yield an average of about six ounces dried, but the amount of water in the orginal fruit is no guide to the food value of the dried product. The main change which takes place during drying is the loss of water, but other changes also occur. Very often the right degree of heat produces changes not unlike those which occur during natural ripening on the plant.

In some cases the crude fiber which forms the basis of the plant structure is reduced in amount or softened. Much of the starch is changed to some form of sugar. The change in flavor is due partly to the proportionate increase of sugar from loss of water and to absolute increase from chemical changes. To determine which of two fruits is more economical, not only must the cost per pound be known, but the amount of bodily fuel that makes for energy and protein (muscle-building material) a pound of each would supply. One must also consider what expense is required to prepare each for the table. Grapes commonly cost less a pound than raisins, but a given sum spent for grapes will buy a smaller amount of nutritive material, since the proportion of water is much higher than in raisins. On the other hand, low-priced fresh fruit is sometimes as economical as a somewhat cheaper dried fruit, since the latter would require sugar and fuel to make it ready for the table. Attention should also be directed to the extent of inedible material.—Office of Information, United States Department of Agriculture.

To Preserve Sweet Cider

During the cider-making season many requests are received for a convenient, efficient and yet inexpensive method for preserving sweet cider. Mustard and horseradish have been employed to this end for years, with varying degrees of success, but there is nothing which commends itself more highly for this particular purpose than calcium sulphite. This must not be confused with calcium sulphate or gypsum. The cider can be preserved either in a fresh, sweet condition, just as it comes from the press, or after it has undergone a desired amount of alcoholic fermentation. For each gallon of cider dissolve one-eighth to one-quarter ounce of calcium sulphite or sulphite of lime in one quart of the cider to be preserved; add this solution to three quarts of cider, making one gallon in all, and mix thoroughly in the jug or cask. Allow it to stand for several days, when it will be ready to bottle if it is so desired. The calcium sulphite can be obtained from the local drug store for about sixty cents per pound or five cents the ounce. Often a little cinnamon, wintergreen or sassafras is added to the bottled cider to give it a spicy flavor, which is more pleasing to some tastes. A pinch of baking soda added at the moment of inserting the stopper helps to neutralize the acid and render the beverage effervescent when it is unstopped. If this is done it will be necessary to tie in the corks.—Walter G. Sackett, Bacteriologist, Colorado Experiment Station, Fort Collins, Colorado.

Some Reasons Why Fruits and Vegetables Spoil

All about us in ground, water and air are numberless little plants called moulds, yeasts and bacteria. Most of them are only visible by aid of a microscope. Some of these little plants do well in one kind of soil or atmosphere, while others require environment of an entirely different nature. The souring of milk, the working of canned fruits, the decay of canned vegetables and meats, the change of cider into vinegar, etc., are all due to the presence of certain of these plants. The fact that they are too small to be seen as they pass through the air explains why so many people believe the air itself causes the working of canned goods. It has been found, however, that it is possible to keep canned goods without sealing in the usual manner by simply filtering all the air that reaches them. For example, take a can of peas, seal it with a plug of cotton instead of the usual lid, then heat it until all the germs are killed, and the vegetables will keep without spoiling because, while the air can pass in and out of the jar, the plants causing the damage are strained out. Experiments of this kind have proved in different laboratories that it is the inhabitants of the air and not the air itself which causes decay.—Miss Grace Smiley, Colorado Agricultural College.

Markets for Canned and Dried Fruits and Other By-Products

H. B. Miller, Director of School of Commerce, before By-Products Division of Northwest Fruit Growers' Association, Portland, September 10, 1914

BY-PRODUCTS, as taken up by your committee, I take it signifies canned fruits, vegetables, dried fruits, jams, jellies and preserves. The development of fruit canning in the United States, according to the United States reports, has been, in round numbers, from $11,000,000 in 1899 to $13,000,000 in 1909, only an increased valuation of $2,000,000 in ten years. That is not a very remarkable increase, nor as great as one would have expected. Without examining into the facts, I am sure we would all have supposed that the increase was far greater. We would have expected, for instance, a great development or increase in California, but the fact is that the quantity produced in California, in canned fruits, in 1899 was valued at $7,340,000, and that produced in 1909 was valued at $7,248,000, so that in the great fruit-growing State of California there has been no great increase in the canning of fruits within the last census period.

I have not been able to secure any reliable data regarding the increase in production since the last census returns. In the matter of exports, however, there has been such a remarkable increase that it seems that there must have been quite a considerable development in the canning of fruits since 1909. The exports in that year amounted to $2,650,000, while the exports in the season of 1912-13 amounted to $5,600,000, or considerably more than double that in 1909-10. So I think we may take it that there has been a very remarkable development in fruit canning since the last census returns.

The great bulk of the fruits canned consists of peaches, apples, pears, apricots, berries and cherries, the valuation being according to this order, peaches being more than double that of any other one product, amounting to over $3,700,000 in 1909, cherries the least of all, amounting to over $1,000,000. Between the years 1899 and 1909 there is quite a marked increase in the value of apples, pears, berries and cherries canned, the greatest increase being in cherries, and these were mostly sour cherries for pie purposes. In California alone, the increase in canned fruits from 1900 to 1912 was from $2,800,000 to $4,800,000.

The value of canned vegetables produced in the United States in 1899 was $28,700,000, while in 1909 it had grown to $51,600,000. The greatest increase in this was in baked beans. The increase in California in canned vegetables during this ten-year period was $1,200,000. The increase in California from 1900 to 1912 was from 800,000 cases to 2,800,000 cases. The quantity of canned tomatoes packed in the United States in 1905 was 6,500,000 cases, in 1913 it was 14,200,000 cases, or considerable more than double the amount in 1905. Canned vegetables exported in 1913 amounted to $1,500,000, slightly less than the amount exported in 1912.

The value of dried fruits produced in the United States was $4,700,000 in 1899 and $19,800,000 in 1909. Prunes $970,000, raisins $1,000,000, apples $2,000,000, peaches $300,000, apricots $455,000, other fruits $49,000, in 1899, as against prunes $5,130,000, raisins $5,000,000, apples $3,000,000, peaches $2,500,000, apricots $2,277,000, other fruits $2,000,000, in 1909. The total increase in dried fruits from 1899 to 1909 was from $4,800,000 to $20,000,000.

In California the production of cured fruit has increased from 145,000 tons in 1908 to 259,000 tons in 1912. The increase was almost entirely in prunes, raisins and peaches. In prunes alone the amount produced in California in 1895 was 65,000 pounds and in 1912 205,000,000 pounds.

Exports from the United States in dried apples increased from 28,000,000 pounds in 1905-06 to 54,000,000 pounds in 1911-12, prunes 10,000,000 pounds in 1900-01 to 118,000,000 pounds in 1912-13, apricots 14,000,000 pounds in 1905-06 to 35,000,000 pounds in 1912-13, peaches 1,000,000 pounds in 1905-06 to 6,500,000 pounds in 1912-13.

In California dried fruits amounted to $2,600,000 in 1899 and $16,000,000 in 1909. In Oregon, $14,000 in 1899 and $173,000 in 1909.

The production of pickles, preserves and sauces in the United States was $36,000,000 in 1899 and $45,000,000 in 1909.

Establishments for canning, preserving and drying fruits and vegetables had, in 1899, an investment of $28,000,000, in 1909, $67,000,000. Wages paid in 1899 amounted to $9,500,000, in 1909 to $15,000,000. The value of products in 1899 was $56,000,000, in 1909, $91,000,000.

In the matter of exports of dried fruits, the most remarkable is in the development of our dried prune exports, which seem to have grown enormously in Europe, as well as in India, Siam, the Philippines, Egypt, French and Portuguese Africa, Dutch Guinea and British Honduras.

PRUNE EXPORTS, BY COUNTRIES

	1908-09	*1913*
	Pounds	*Pounds*
To Germany	8,500,000	49,000,000
To The Netherlands	2,750,000	16,500,000
To Belgium	2,000,000	6,300,000
To Denmark	1,000,000	3,750,000
To France	14,000	12,000,000
To Canada	6,600,000	11,000,000
To Great Britain	3,750,000	8,500,000

Another very remarkable expansion of dried-fruit exports has been in our exports of dried apples, which in 1913 amounted to over 10,000,000 pounds to Germany, 6,000,000 pounds to The Netherlands, and only 5,000,000 pounds to all the rest of the world. Our exports of dried apricots reached the amount of 16,000,000 pounds in 1913, Great Britain taking 5,000,000 pounds and Germany 3,000,000 pounds. Our canned goods are exported largely to Great Britain, which took in 1912 $2,261,000 worth, while all of Europe took but $2,900,000. North America took $1,150,000 and South America took only $100,000. Our exports in jams, jellies and other preserved fruits does not exceed more than about $200,000 in value, two-thirds of which goes to North America, practically to Canada and British Columbia. In dried fruits, then, we may say that we have the world for a market, as well as an enormous market in the United States. In canned fruits our markets are limited largely to Great Britain, North America and the United States. In jellies and other preserved fruits our market is practically at home, in our own country.

The exports of pickles, sauces, etc., in 1912 was $285,000 to Europe, $1,150,000 to North America, only $20,000 to South America, and small amounts to other parts of the world.

The exports of canned vegetables to all European countries amounted to only $347,000; $195,000 to the Philippines; $1,035,000 to North America; $58,000 to South America, and very limited amounts to other parts of the world, including $66,000 to Asia.

From this data it will be observed that the greatest opportunity for the development of markets for the by-products of the Northwest lies in dried fruit to European countries, some to Asiatic countries, and canned fruits almost exclusively to Great Britain and North America. The great increase in the exports of prunes has been in the years that very satisfactory prices have been received by the producers. As far as the Oregon prune is concerned, these increased exports have taken place on the basis of five cents per pound to the growers, which is certainly a most satisfactory condition of market development. During 1912-13 the prune exports from the United States to foreign countries were more than half the total production of the dried prunes of the United States. These great exports can continue to grow on the basis of five cents to producers and offer great encouragement to the increased production of prunes.

In the matter of dried apples the situation is somewhat different. Reports from New York show that in 1900 the apple growers received fifteen cents per bushel for apples that went to evaporators, or about $6 per ton. In 1901 they received 32 cents per bushel, or approximately $14 per ton. In 1902 and 1903 they received approximately $10 per ton. The latest reports from New York show that in a ten-year average growers received for apples that went jointly to evaporators and vinegar plants $10 per ton. New York is the greatest of all apple-producing districts and produces more dried apples for export than any other state, and if this section of the country is to compete with them in the foreign markets, probabilities are that we are not likely to receive a price in excess of $10 per ton. These figures of the ten-year average show that 37½ bushels to the acre of culls were sold for evapo-

ration and cider stock, and the report says that the price of $10 per ton was above the average and that probably $8 per ton would be nearer the general average in the state.

Our consular returns in our investigation of foreign markets shows that chops from the United States sold in Germany at from 2 to 3¼ cents a pound Just what price may be realized after there is an extensive development of the production of dried longanberries, raspberries, etc., in the Northwest is a little difficult at this time to determine. If the development is kept in harmony with the extension of the markets, there is a prospect that the longanberry at least, and probably the blackberry, will be sold in the market for drying for 2½ to 3½ cents per pound for the fresh berry. Insofar as foreign markets are concerned, however, for these products, our investigations revealed that there has been little or no development, and if this country continues to plant and produce berries to be marketed in the dried form extraordinary efforts will have to be made to prepare the market for them, and the probabilities are that these markets will have to be found mostly in North America, at least until some great effort is made for their introduction into foreign countries.

In the matter of jellies, preserves, pickles, etc., foreign markets reveal a very small proportion of goods of that character from the United States. The market for these things will also have to be strenuously exploited and developed. There is no reason, however, why these products should not be extensively produced here in the Northwest and marketed all over the world. In the line of berries we produce the best that the world grows. Strawberries, raspberries, blackberries, loganberries, gooseberries and others of a similar nature that are produced here in the Northwest cannot be excelled in any part of the known world. But the market side of the question has yet to be worked out, and to proceed with any extraordinary production on these lines, without at the same time making special efforts to extend the markets would be extreme folly. I have seen strawberries, blackberries and raspberries sent from British Columbia to Crosse & Blackwell at London, shipped in barrels, to be prepared into jams, jellies, etc., for the world's markets.

Insofar as the production is concerned, there is no reason why a very extensive industry in this line should not be developed here in the Northwest. With the opening of the Panama Canal we are put on the map. As far as world's markets are concerned we will be able to compete in the production of this class of goods if we devote ourselves to the production of high-class articles of a standard quality and organize for marketing the same. The new rate of transportation by the Panama Canal on canned goods from here to New York, for instance, is 30 cents per hundred, as against 85 cents by rail, and for dried fruit is 40 cents per hundred, as against $1 by rail, and a reduction to all European points of one-half the present rail and steamer rates by direct shipment. This should give a great impetus to the development of all dried and canned goods for which this country is especially fitted for production.

Nothing further is now needed but the organization of communities and districts for canning, drying and preserving, and the further organization of selling agencies to distribute these goods through the world. Here in the Northwest we are usually too prone to harp upon our splendid possibilities of production, to view with pride and pleasure the various fruits and vegetables which we produce, to praise in all kinds of literature the excellent advantages which we have in production, and then to sit quietly down and fold our hands and expect some unseen power to take up the problem of preparation and marketing these splendid fruits for which we have all of the excellent conditions of production. We have been given to making exhibits only of our raw products, advertising them on all occasions almost all over the world for the purpose of getting more producers into this territory, and we have failed to realize that preparation and marketing are just as essential as production. We now find ourselves with vast quantities of fruits produced, unprepared for market and without the commercial machinery to carry them to the consumer. This great City of Portland has neglected seriously that feature of its proper function. They seem to have considered that their duty is to bring producers into this territory, while as a matter of fact their primary function is to market the products of the Northwest. If these products are marketed in such a way that the producers get fair returns for their labor and investments, the question of increasing producers will take care of itself. A producer who is making a profit and having a comfortable existence will be the best advertiser for the country. If the producers of fruits, berries and vegetables here are not securing a profit from their products, the difficulty is almost entirely confined to the market end of the problem.

The commercial and business interests here have permitted the people from California and other states to do most of the marketing of the fruit products. The California cannery people have had no well-defined interest in bringing up the production of fruits in this territory, nor have they been interested in any way in seeing that the producers received fair returns for what they grew. On the other hand, they have continually hammered down the prices to the producer until he has been totally discouraged in the whole question of trying to produce fruits and berries for the Portland cannery.

A few years ago a producer of Bartlett pears in Oakland, Oregon, experimented with the market in California and an Oregon cannery. He divided his crop equally in quantity and quality, sending half to California and half to the cannery in Portland. The Portland cannery reported that his pears were inferior and so poor that they could not afford to pay but a very small price; I think it was about $9 per ton. The California cannery reported his pears excellent, entirely satisfactory, and paid him a price three times that paid by the Portland cannery. This year the California canneries have bought pears at Salem and shipped them to California for canning, paying as high as $42 per ton for the first quality and $25 per ton for the second grade. It has finally become a well-established fact that the Oregon Bartlett pear, although not quite so good for shipping in the fresh state, is fully equal, if not superior, to the pears produced anywhere in the world for canning purposes. Had this fact been made clear by the canneries of Oregon years ago, and the growers encouraged in that line of industry, Oregon would today be taking in immense quantities of money for canned pears.

The Oregon canned pears are now pronounced in France and Great Britain to be especially fine. In fact, in our world survey of the fruit markets, we find it uniformly established wherever Pacific Coast canned goods find a market that they are pronounced thoroughly satisfactory, if not superior, to the canned fruits from any other part of the world. The canneries now operated and maintained by Oregon people are proving that the Oregon Bartlett pear, the Oregon strawberry, gooseberry, blackberry and raspberry cannot be excelled, and in all of these lines prospects are excellent for an expansion in trade. The manager of the California Fruit Canners' Association, Mr. C. H. Bentley, in his address before the California Fruitgrowers' Convention pays high tribute to all of these Oregon products and wishes that in some of these things they could produce as good quality in California as we produce here. He pays a particularly high tribute to the Oregon strawberry and says that the markets will take great quantities of them. He pays equally high tribute to the Oregon gooseberry.

What is absolutely necessary for the development of this industry in the Northwest is the establishment of canneries and dryers owned and operated by the people of this territory and their produce marketed by an association permanently interested in the development of the industry. This organization seems to be imbued with the importance of securing a market for the by-products of the fruitgrowers. To my mind, this should not be the central idea of the canning and drying and preserving industry. If this territory has the real natural advantages for the production of a high quality of fruits, berries and vegetables of certain types, it is of primary importance to put up a high quality of goods, to distribute them and establish a reputation for high-class products. We must make a reputation for our canned pears, for our cherries, for our blackberries and

raspberries, our loganberries, our strawberries, our string beans, our beets and other kinds of vegetables. We must make a reputation for a fine quality of dried fruits of all kinds which we can produce to advantage, and when we have done this, when we have established canneries and dryers, and factories for producing jams, jellies and fruits in various forms, of the finest quality, the by-product question will take care of itself. These plants will have no difficulty in handling the by-products after they have established a substantial reputation for all these various qualities of high-class fruits, berries and vegetables.

An investigation of the subject will reveal, I think, beyond any question, that the organizations which are succeeding in these lines are those that are producing a high quality of goods. There ought to be a hundred canneries and drying plants in the Northwest producing all kinds of canned, preserved and dried products, all associated into one selling organization. A selling organization should supervise the standard and quality of the things produced and exert every possible encouragement by finding a market. I think it is fundamental under conditions existing here that the producers and market agencies should have a community of interest and operate in complete harmony under some unit system of organization. The important thing in marketing canned goods is to be able to provide the greatest diversity of production. It is essential that they should be able to handle large quantities of peaches, apricots, cherries, beans, berries of all kinds, and to do this successfully these things will have to be produced in this section of the country according to the soil and climatic conditions favorable, and assemble under one selling organization. That, I think, is quite necessary to the successful establishment of the industry in this country.

It will be observed that our best market for dried fruits is in Germany and the Netherlands, and that our only great market for canned fruits is in Great Britain and North America. We naturally wonder why Germany is not also a great market for our canned and preserved fruits. A careful examination of the foreign markets reveals the fact that the greatest handicap to our trade in these products is due to the heavy duties charged in foreign countries, excepting in England. A serious handicap to our South American trade in both dried and canned fruits lies in the heavy duties provided in those countries. In Argentine the duty is 2½ cents on dried fruits; in Brazil 7.6 cents per pound; in Chile 8¼ cents per pound; in Uruguay 7 cents per pound. In Germany the rate on jams, jellies, etc., is 6½ cents per pound, and the people have petitioned the imperial office to have that rate doubled. They have also petitioned the government to have all of the steamship lines, subsidized by the government, purchase their canned goods in their own country. In Argentine the rates of duty on canned goods range from 7 cents up; the duty in Brazil on fruit jams and jellies is 19 cents per pound; in Italy the duty on canned goods is 10½ cents per pound, on jams and jellies it is between 8 and 9 cents per pound; in the Netherlands the duty on canned goods preserved with sugar is 14½ cents per pound, on jams and jellies 3½ cents per pound; in Russia it is 21 cents per pound for fruit in tins.

If it were not for these high duties there is no doubt but that our exports in canned and preserved fruits could easily be more than doubled. Our new tariff law has no reciprocal returns in tariff rates with foreign countries. It would seem that we have opened our country to imports of nearly all things from South America free, while we have gained nothing in reciprocal arrangements with those countries. The entire Pacific Coast is deeply interested in this problem of foreign duties on our products and the fruitgrowers should see to it that there is developed in this country a well-defined purpose to have the markets of other countries opened free to our products where we open our markets free to them. I call your attention to this fact with no motive of a political nature, but merely to point out to you the absolute necessity of a movement of this kind, in order that the fruit interests of this section of the world may be properly developed and have a fair field.

The primary necessity of the Northwest, from my point of view, lies in the development of organizations for preparing and marketing products along all lines of fruits, vegetables and berries for which we have exceptional advantages of production. A well-defined campaign for this purpose ought to be organized and carried out by this or some other association. The agricultural colleges should be asked to divide the various districts and their special capacities for production of the different classes of fruits, etc., and to designate the districts where certain things can be produced to the best advantage. They should be asked to work in harmony with the schools of commerce and other organizations for the encouragement of the development of association and organizations for handling the products of the various districts where conditions are favorable.

Through this organization the various commercial organizations throughout the Northwest should also be urged to take up the plan and earnestly cooperate for the establishment of associations that will prepare these products in a high-class form for commercial uses. Their influence should also be requested in endeavoring to get these organizations, when established, to a general selling agency that will handle the products of all of these associations. It is my firm conviction that the welfare of the whole problem of fruit growing is wrapped up intimately with this question of the establishment of organizations for the canning, drying, preparing and marketing of these products.

Lane County, in this state, has taken a splendid lead in this direction and has four organizations of this character putting all their fruit products into excellent marketable condition, establishing a first-class quality, and the by-product problem is being settled in this way. At Eugene they are canning, drying, pickling, preserving and putting into vinegar their fruits, berries and vegetables, and if every other part of the Northwest having equal advantages would simply do the same we would soon have the establishment of an industry that would make fruit growing, in general, one of our most substantial and profitable industries.

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Total	$5.50
All for	3.70
Fruit and Produce Distributor	$2.00
Better Fruit	1.00
Total	$3.00
Both for	2.00
Delineator	$1.50
Everybody's	1.50
Better Fruit	1.00
Total	$4.00
All for	3.10
Harper's Magazine	$4.00
Good Housekeeping	1.50
Better Fruit	1.00
Total	$6.50
All for	5.45
Gleanings in Bee Culture	$1.00
Good Housekeeping	1.50
Better Fruit	1.00
Total	$3.50
All for	2.65
Ladies' World	$1.00
Modern Priscilla	1.00
Pictorial Review	1.00
Better Fruit	1.00
Total	$4.00
All for	2.50
Today's	$0.50
Ladies' World	1.00
McCall's	.50
Better Fruit	1.00
Total	$3.00
All for	2.00
Pacific Homestead	$1.00
American	1.50
Better Fruit	1.00
Total	$3.50
All for	2.50
Northwest Poultry Journal	$0.50
Good Housekeeping	1.50
Everybody's	1.50
Better Fruit	1.00
Total	$4.50
All for	3.60
Oregon Agriculturist	$1.00
Northwest Poultry Journal	.50
Better Fruit	1.00
Total	$2.50
All for	1.85
Hoard's Dairyman	$2.00
Woman's Home Companion	1.50
Better Fruit	1.00
Total	$4.50
All for	3.15
Western Farmer	$1.00
Northwest Poultry Journal	.50
American Bee Journal	1.00
Better Fruit	1.00
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All for	2.35

Through lack of space we are unable to give a more extended clubbing list. Rates on all magazines will be given to any of our subscribers by writing "Better Fruit."

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Disk Harrows and Plows

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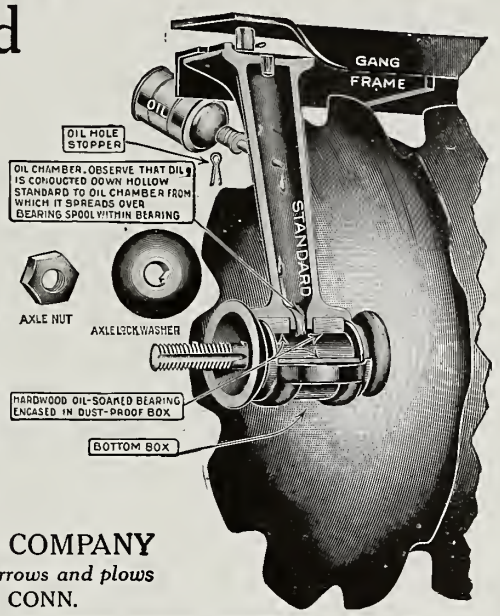

THE CUTAWAY HARROW COMPANY

Maker of the original CLARK disk harrows and plows

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Cold Storage of Apples

[Office of Information, United States Department of Agriculture]

THE proper funetion of cold storage is to retard the ripening processes of the fruit and the development of decay organisms and skin blemishes. The first responsibility for the keeping quality of his fruit rests with the grower, since it is his growing and handling methods that largely determine its vitality, freedom from disease and general condition when stored. Cold storage is not a remedy or a restorative for poorly developed, weak, imperfect fruit, but is the most effective method of preserving the quality, flavor and appearance possessed by the fruit at time of picking.

The first step in successful cold storage of apples has been found to lie in the practice of such cultural, spraying and pruning methods as insure production of the sound, healthy, well-colored fruit, free from disease. Assuming this as the first requisite, the following factors have been found to most influence the keeping quality of the fruit and furnish best conditions for long storage: (1) Proper maturity at time of picking; (2) care in all handling operations; (3) prompt storage after picking; (4) a proper storage temperature.

Careful and extensive investigations have demonstrated that fruit picked at full maturity can be held for a longer period in storage and is less affected by scald and decay than that pieked when somewhat immature. Two important commercial varieties, Rome Beauty and Winesap, have been found to be especially susceptible to scald during storage, if picked prematurely. There is no doubt that several thousand dollars are lost to the industry each year through the improper picking of these two varieties alone. The results emphasize strongly that more care and attention should be paid to this detail of the harvesting operations than is usually the case. By full maturity, however, is not meant over-maturity, which may cause fully as heavy losses as immaturity. Each grower should study his own fruit and his own conditions in order to determine the proper picking stage. Probably the most reliable single indication of maturity is the whitening or slight yellowing of the "ground color" of the fruit. This is the color underlying the blush or red color and should not be confused with the latter.

Care in all handling operations is the second important requisite of successful storage. A class of fungi, of which the common blue mold is an example, are known to be unable to attack and cause decay of healthy, uninjured fruit. In spite of this fact, very serious rots, both in storage and in transit to market, are the work of fungi of this type, and the largest contributory cause in all cases is bruising or skin breaking suffered by the fruit in the picking and packing operations. Microscopic bruises and breaks in the skin are large enough to afford entrance to the spores of these fungi and the necessity for the utmost care in all operations connected with the handling of the fruit to avoid bruising and mechanical injuries is more urgent than most growers realize.

There is a marked difference in condition between fruit stored as soon as possible after picking, usually not more than two days later, and otherwise comparable lots of which the storage was delayed ten days or two weeks. Such delay is especially injurious during a period of warm, humid weather. The delayed fruit at withdrawal from storage is riper, yellower and duller than the corresponding "immediate" stored fruit and in addition develops more serious scald and decay. The importance of eliminating all avoidable delay cannot be too strongly emphasized.

The standard storage temperature for apples is 31 to 32 degrees Fahrenheit, and this has been found to be the best for long keeping of the fruit. Higher temperatures permit the ripening of the fruit to advanee more rapidly than at 31 to 32 degrees, with the result that the fruit at the higher temperatures reached the end of its storage life much sooner. In addition, the lower temperature retards most effectively the developments of fungus decays and skin blemishes. For a short storage period higher temperatures may be used without serious trouble, especially with the better keeping varieties, but for long keeping 31 to 32 degrees will best maintain the color, quality and texture of the fruit. Apples should be withdrawn from storage while still firm, and in this condition can be held on the market in satisfactory shape for several days or weeks. If allowed to become excessively overripened in storage, however, they will break down very fast on withdrawal. Apples from 32 degrees will as a rule hold in better condition after withdrawal from storage than will comparable lots from higher temperatures. There are several other factors affeeting the behavior of apples in storage, but those discussed have been found to be of greatest importance, and their proper control will solve a large percentage of our present serious storage difficulties.

Housewives $10 Library

Recommended by the Department of Home Economics of Colorado Agricultural College.

Food and Household Management. Kinne & Cooley, authors. Macmillan & Co., publishers. New York. Price $1.00.

Practical Cooking and Serving. J. M. Hill, author. Doubleday, Page & Co., publishers, Garden City, N. Y. Price $1.50.

Boston Cooking School Cook Book. F. M. Farmer, author. Little, Brown & Co., publishers, Boston, Mass. Price $2.00.

Theory and Practice of Infant Feeding. H. D. Chapin, author. W. Woods & Co., publishers, New York. Price $2.25.

Home Care of the Sick. A. E. Pope, author. American School of Home Economics, publisher, Chicago, Ill. Price $1.00.

Shelter and Clothing. Kinne & Cooley, authors. Macmillan & Co., publishers, New York. Price $1.00.

Healthful Farmhouse. H. Dodd, author. Whitcomb & Barrows, publishers, Boston, Mass. Price 60 cents.

Laundry Work for Use in Home and Schools. J. L. Sheppard, author. Webb Publishing Co., publisher, St. Paul, Minn. Price 60 cents.

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In the United States, $1.00 per year in advance
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ADVERTISING RATES ON APPLICATION

Entered as second-class matter December 27, 1906, at the Postoffice at Hood River, Oregon, under Act of Congress of March 3, 1879.

APPLE PRICES—PRESENT AND FUTURE

Without question the amount of apples harvested, packed and shipped this year will be far below the estimates that have been quoted in nearly all publications over the United States. The markets so far have been crowded under unfavorable conditions and with fruit frequently arriving in off condition and overripe.

On account of the heavy shipments being made in October and November, there is every reason to assume that the quantity of apples to be sold will be heavily reduced by the first of December or the first of January at the latest. Then it will also be ascertained that the crop will be far lighter than original estimates. It may also be assumed that business conditions will improve and by that time people should begin to recover from the war scare and go about their business in a normal sort of way, for there is no reason why business should not be good in the United States in a general way and continue so.

It is usually true that when the crop is large prices in the beginning of the season are low and advance later in the season. With a light crop the reverse is usually true because so many growers hold in order to get a higher price later in the season, which crowds the end of the marketing season. Therefore, taking everything into consideration, it seems reasonable to suppose at the present writing that there is a fair chance for the apple market after the first crowd is over, to show an improved condition with a reasonable advance in prices.

APPLE PRICES OF 1914

Every year in the apple business is different,—an old saying but a true one. Conditions prevailing this year have never before been duplicated and many conditions have existed or have been created, each one sufficient in itself to materially affect prices. Taken altogther, they have created a very depressing effect on marketing prices. We are referring to these editorially in several paragraphs.

Effect of Apple Estimates on Prices. Again we feel compelled to speak very plainly and severely regarding apple estimates. Estimates are invariably put out in the blossoming time, when the trees are in full bloom and the crop looks very large in the eyes of the estimators. There is an occasional year when the crop overruns the blossom estimate, but it is seldom. There are too many things to happen after the blosoming time to reduce the crop and very few to happen to increase it.

This year the Northwest was estimated during the blossoming time at from 23,000 to 25,000 carloads. It is probably safe to say now that the Northwest apple crop will probably not exceed 12,000 carloads. A great many ordinary varieties and low grades are not being packed. In all probability not over 8,000 carloads (there may be considerably less) of the Northwestern crop will be shipped east. This is from one-half to one-third of the original estimate of the Northwestern crop.

The government has estimated that the crop of the United States will be 71,000,000 barrels. There is quite a general opinion prevailing, although it may not be universal, that the crop of the United States will be somewhere from 40,000,000 to 50,000,000 barrels. In addition to this, a great deal of guessing is being done as to how much of this will be packed up commercially and placed on the market. Various guesses run from 30,000,000 to 40,000,000 barrels, but the end of the season will tell the story, and if the latter figures are anywhere near correct it is apparent that there has not been sufficient occasion to justify the depression in prices on account of the quanitty.

The Effect of Early Marketing on Prices.—The impression seemed to be created that apples are going to be very low in the winter and late in the season, and growers were informed that the best opportunity to secure good prices would be very early in the season. Many growers picked their apples early and shipped them just as quickly as possible, thinking this would be the only opportunity to secure good prices. I know this to be true, because personally several of my friends have informed me that they had been given this "tip" and I personally know that they picked their apples early, picking the Newtowns when they were absolutely green,—long before the proper maturity period for picking. Advices from Watsonville, California, show that the Watsonville shippers were packing up their Newtowns just as fast as possible and shipping them. A large quantity of these were exported and reports from England are to the effect that, while the prices were fair, the immense shipments being consigned had lowered prices very materially.

While extensive early shipments have been made of Newtowns and while everyone knows that the Newtown is a very late-maturing apple and is not ordinarily ready for consumption until about the first of January, it is the last apple which should have been shipped, this early shipment was far more extensive on other varieties, and the result was that the early markets were crowded beyond reasonable consuming capacity on apples. They should have been held and shipped along in a regular and even way to supply the consuming trade.

The Effect of Shipments Without Ice.—The depression in reference to prices this year was so extensive that many growers and shippers have had no other idea in their head except to put the apples on the market at a minimum cost. Consequently many shippers forwarded apples of the late fall varieties without ice in order to save the ten cents per box icing charge. This has been done extensively. The effect on the market has been disastrous. As a specific illustration, a carload of Jonathans shipped to Boston, which arrived in fairly good condition as far as outward appearances went, sold at $1.50 per box. But after being delivered to the retail dealers and opened up they were found to be so ripe that practically every retailer who had bought at $1.50 returned them to the wholesaler. On account of their being overripe and soft, the wholesaler had to sell them out to peddlers, or in any other way he could get rid of them quickly, and sold the lot at $1.00 per box. In other words, apples that sold at $1.50 per box, on account of being overripe, due to the lack of icing, where the shipper endeavored to save ten cents per box, sold for $1.00, cutting the price 33⅓ per cent. The grower threw away 40 cents per box.

The Effect of Grading on Prices. Apple growers as a class of people have the same human natures as generally exist in mankind. There are many who are good, there are some who are indifferent and their there are some otherwise. It is to be regretted that there always has been, is and always will be, a number of apple growers, when not properly controlled with a very thorough inspection, disposed to act as follows: When the crop is light and prices are good, they crowd the grade because apples bring good money and they want to get all they can. When the crop is heavy and prices low, they crowd the grade on the ground that "anything is good enough" for the price they are getting. Such work can only be eliminated by a very thorough and rigid inspection.

The Effect of Business Conditions on Prices.—Everyone who knows anything about financial affairs and business

conditions is aware of the fact that ever since 1907 business conditions have been far from normal, due to many reasons with which most growers are familiar, and on account of limited space here will have to be omitted. With business rather under normal and financial conditions tight, it can be readily understood that the prices on fruit will be more or less affected.

The Effect of War on Prices.—On the first of August, when war was declared, not only Europe but the United States and other countries were also affected. Immediately an uncertainty sprang up both in business and financial matters. Consequently everybody became extremely conservative, purchasing was reduced and people in general were disposed to hang onto what money they had instead of spending it except for what was absolutely necessary, which naturally enough affected the fruit market and prices.

The Effect of Export Trade on the Apple Market.—On account of the war, Germany up to the present time has been eliminated completely as a purchaser of American apples. While it is true that so far exports have been some greater for corresponding weeks with last year, this to a great extent is due to the fact that apples matured early and shipments became heavier earlier in the season than last year. Without doubt the purchasing power of England and other European countries will be reduced, which naturally to a greater or less extent affects the apple prices. However this export trade should not continue to materially affect selling prices this year, for the reason that it is estimated that only approximately five per cent of American apples are exported to European countries.

The Oregon Horticultural Society will hold their annual meeting in Medford in December this year, having become convinced after having previously held their annual meetings in the City of Portland that it would be wise to hold them in different fruit sections of the state. There are a few progressive fruitgrowers who always attend regularly every state horticultural meeting no matter where it is held, but the majority of fruitgrowers are either not inclined to do this or feel the expense is too much of an item. They do not realize how valuable and instructive these horticultural meetings are or none of them would consider the expense too great to attend. The State of Washington has changed its place of meeting annually, holding it in different sections. The editor of "Better Fruit" has been invited to address the Washington Horticultural Society meeting each year for the past several years, and has attended and addressed their meetings at Spokane, Prosser, Clarkston, North Yakima and Walla Walla. Two meetings previous to these were held at Wenatchee and Everett. Each one of these meetings was attended by from five to seven hundred growers. The point is simply this, if the meeting is held in a fruit section of several hundred fruitgrowers it is a very easy matter for them to attend and they are put to practically no expense. It was generally understood at the Oregon State Horticultural Meeting in Portland last year that the meeting in 1915 would probably be held in Hood River. This will depend on the vote that will be taken in Medford and the desire of Hood River to have the meeting next year. The different sections that want the Horticultural Society meetings in their locality are supposed to put in a personal request and send representatives extending them the invitation for the Horticultural Society to meet in the principal city in their section.

National Apple Day and the Railroads.—Nearly all of the Northwestern railways showed their interest in the apple on National Apple Day by serving apples in the most attractive ways possible on all of their diners running in and out of the Northwest.

National Apple Day and Hotels.—Nearly all of the hotels in the Northwest observed Apple Day by serving elaborate apple menus.

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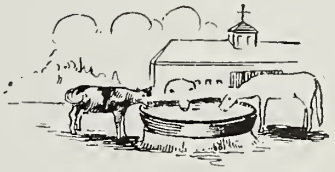

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The War News.—If you want to absolutely waste two or three hours a day without learning much of anything, take the war news each day and read it all. In previous wars the war news as given furnished reliable and full information about the progress of the war. In this present war news is censored so severely that from the war news given in the papers one seldom gets more than a few of the unimportant details, which are enlarged into four-column articles. The war correspondents of some of the greatest publications in the United States are cabling a one and a half column message which absolutely gives no further information than to state that the writer slept on a bed of straw on the floor of a garage or he only had a loaf of rye bread to eat in three days. Such news about the war is tommyrot and it is certainly a waste of time to read it. In fact most of the war news so far is about similar details and slight engagements which have no significance as to the actual conditions. About the only information that seems worth while is that either one side or the other is advancing, and just how valuable even this information is becomes a question, for the reason that the war report from one country states the enemy has retired and the war report from headquarters of the other country on the same day reports just exactly the opposite.

So, again, it seems well enough to say: Do not spend so much time reading the war news, but spend your time talking business and attending to your own business.

Perhaps in no section of the United States have the railroads and agricultural colleges shown more progressiveness than in the Northwest. Every year the various railroads of the Northwest in different states send out demonstration trains, accompanied by a staff of lecturers from the different agricultural colleges in Oregon, Washington and Idaho. These trains are equipped with exhibits of the most approved machinery for doing farm work to the best advantage in the most economical way. In addition to this, they are equipped with many exhibits of products in the horticultural department, and always very extensive exhibits from nature showing all the different diseases of fruit trees. These trains are frequently accompanied by thoroughbred cattle, hogs and chickens. Usually a staff of lecturers from the agricultural colleges accompany these trains with specialists in the departments of horticulture, dairying, poultry, cattle, grain, etc.

The Agricultural Colleges of Oregon, Washington and Idaho will hold short courses during the winter for the education of farmers in practically every department of farming. The Oregon Agricultural College has already announced their dates as follows: Farmers' Week, November 30th to December 5th; Forestry Short Course, November 2d to April 16th; Winter Short Course, January 4th to 30th. We regret we have not received the dates of the Washington Agricultural College and the Idaho Agricultural College winter short courses, but the same can be secured by residents of these states by writing the state college. These courses have proved so highly instructive and beneficial to every attendant that we have no hesitancy in saying to the farmers and fruitgrowers of the Northwest that everyone who can possibly spare the time and expense, which is very small, to take one of these winter courses, should avail themselves of the opportunity to do so this winter.

Economy in Harvesting Apples.—The editor of "Better Fruit" was one of the first growers of the Northwest to furnish a public statement of the actual cost of harvesting apples, showing in detail the cost of each individual expense, box, paper, packing, picking, grading, hauling, etc. This was followed by a great many growers publishing their expenses in various publications, and by comparison the growers have learned where any one part of the harvesting expense connected with their own business was too great. Consequently the growers during the last couple of years have been studying economy in the harvesting cost. It is safe to say that many growers are harvesting their apples this year at from five cents to twenty cents per box cheaper than formerly.

The Seventh National Apple Show at Spokane this year will devote a special part of the program to the discussion of the costs of harvesting, and without question the many experiences of the growers will be very valuable in assisting other growers to reduce this expense.

National Apple Day.—Mr. James Hanley of Illinois deserves great credit as being the originator, promoter and developer of a National Apple Day in the United States. The immense amount of publicity that is given to the apple on the National Apple Day without any question has a very stimulating influence in starting the consumption of apples. While some growers have different ideas as to the most advisable date for National Apple Day, it seems that there can be no question that the proper time for a National Apple Day was wisely selected, because October 20th is just in advance of the time when fall and winter apples begin to become plentiful and is therefore just the right time to start the people consuming apples.

The Seventh National Apple Show.— The Seventh National Apple Show at Spokane will be held from November 16th to 21st. Reports from headquarters indicate that this will be one of the best apple shows that has ever been pulled off, as the number of exhibitors who have already promised to exhibit is very large indeed. In addition to this feature, there will be many special features like Wenatchee Day, Yakima Day, Spokane Day, Walla Walla Day, Hood River Day, etc. Perhaps equally as important is the general conferences of growers at which discussions will take place on all features connected with the orcharding industry.

Manufacturers and Land Products Show.—The Manufacturers and Land Products Show is being held in Portland the last week in October and the first two weeks in November. Without question this is the greatest and most extensive show that has ever been pulled off in Portland, and it may be truthfully said that its educational value in showing the resources of the Northwest is almost incalculable. In the December issue of "Better Fruit" we intend to have a complete account of the Land Products Show in the form of a good story.

The People of the United States and the Present War.—About nine men out of ten, if you talk to them for an hour, will spend about 59 minutes talking about the war and the depressing effect on business. About the same number spend about one-quarter of their business time in reading the war news in detail. If the people of the United States will stop reading so much war news and stop talking so much war talk and talk business and attend to business, without question, in our opinion, the business conditions of this country will rapidly begin to improve.

The Apple Demonstration of the O.-W. R. & N. Co.—The O.-W. R. & N. deserves special credit from the apple growers and the business interests of the Northwest for their enterprise in going to the expense of employing an expert on cooking apples in various ways to demonstrate to the people,—the consumers of the Northwest,—the best methods of cooking apples in ways too numerous to mention.

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ASK FOR PREMIUM LIST

Surgery for Sick Trees

[Weekly News Letter, United States Department of Agriculture]

A CAVITY in a decayed tree is something like a cavity in a decayed tooth. If an unreliable tree surgeon who has been called in to save the tree only partially removes the diseased part of the wood, uses no antiseptic coatings in the cavity, and fills it up with cement, the tree is no more cured than is a person whose decayed tooth has not been properly filled by a dentist. The only difference is that after the tree cavity has been covered, if the work has not been properly done, the tree has no way of making its trouble known except by further decay.

Within the last decade there has been a great increase in demand for surgeons to repair decaying shade trees, but the possibilities of practicing fraud in this profession, like the instance just cited, have tempted so many unreliable people to dabble in the science that tree surgery has fallen somewhat into disrepute. The department realizes that commercial tree surgery should occupy a high place in the estimation of the public, and has recently issued a pamphlet entitled "Practical Tree Surgery," wherein suggestions are made for improvement along these lines.

As in all professions, there are reliable and unreliable men and firms competing for contracts in tree surgery. In recent years so many occasions have arisen when property owners felt the necessity of calling in commercial tree surgeons to attend to their trees that there are now numerous firms, both honest and dishonest, engaged in the work. Usually tree surgery is practiced in connection with some nearly related line, but often it is taken up as a business of itself. When a blight such as the chestnut bark disease infects the trees of a district, the community, or individuals in it, will often spend considerable money to control ravages which may rob the whole district of its trees. An affection like the chestnut bark disease is contagious. It requires scientific knowledge of the disease to know whether an affected tree should be destroyed at once or is worth treating. It requires scientific training to understand the manner of growth of the fungi causing the disease and what treatment is best. Many individuals who have had faith in tree surgery have lost it through following the advice of unreliable tree surgeons who claimed to be able to diagnose a case, but whose main interest was to collect a good sum of money for their work.

Besides the careless filling of decayed cavities in trees, there are other practices of certain so-called "tree surgeons" that do the trees more harm than good. Many of these "surgeons," as well as the people who employ them, do not realize the danger arising from fresh injuries to a tree. The tree owner should realize that prompt attendance to fresh injuries will largely do away with the need of tree surgery fifteen or twenty years hence. The tree surgeons must realize that if they make fresh injuries in the living bark, when treating decayed portions, they are laying the tree open to more dangers of infection that will result in further decay.

Just as a person is subject to infection through cuts and scratches, trees are rendered subject to infection by having their living bark torn. Notwithstanding this, many tree surgeons use pruning hooks and climbing spurs and cut fresh gashes in the tree. To break off small dead branches a workman may use a long pruning hook as though it were a club. In doing so the hook usually causes injury to the young bark nearby. Every new wound may furnish a new point of entrance for decay, even though the old dead branch may have been removed. The use of climbing spurs should be particularly avoided on trees in vicinities where there is a contagious infection. They simply render the treated tree all the more liable to catch the disease which is "in the air."

All properly equipped firms of commercial surgeons should have ladders that would reach forty or more feet into a tree. Ladders, ropes and rubber-soled shoes will allow a man to reach practically every part. Reliable estimates indicate that it takes somewhat longer (perhaps 25 per cent on an average) to do work on a tree when these are used instead of climbing spurs, and this is one reason why many firms who value remuneration more than reputation use the spurs.

The department is suggesting a plan that may help put commercial tree surgery on a better basis. Owners are urged to have a definite written contract with the tree surgeons they employ, and the following is suggested as a model for such contract: (1) No climbing spurs shall be used on any part of a tree. (2) The shoes worn by the workmen shall have soft rubber bottoms. (3) Ordinary commercial orange shellac shall be applied to cover the cut edges of sapwood and cambium (which is the soft formative tissue from which the new wood and bark originate) within five minutes after the final trimming cut is made. (4) All cut or shellacked surfaces shall be painted with commercial creosote, followed by thick coal tar. (5) All diseased, rotton, discolored, water-soaked or insect-eaten wood shall be removed in cavity work and the cavity inspected by the owner or his agent before it is filled. (6) Only a good grade of Portland cement and clean, sharp sand in no weaker mixture than 1 to 3 shall be used to fill cavities. (7) The contractor shall repair free of expense any defects that may appear in the work within one year.

If the owner prefers to have a cavity filled with asphalt or other material instead of cement, the contract can be altered accordingly. If it is desirable

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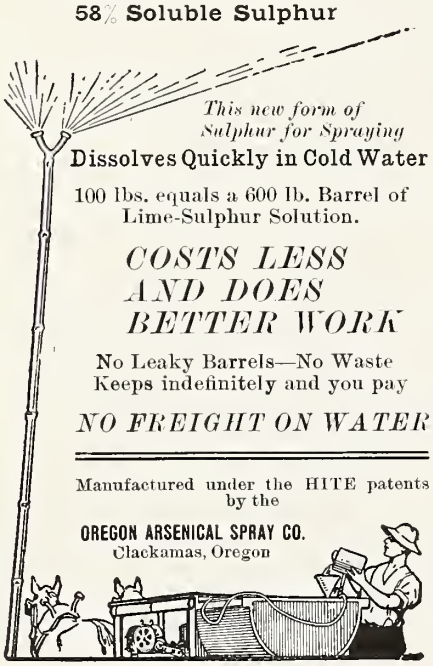

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to substitute some other preparation for shellae, this can be done. Similarly, under certain conditions, various other modifications may be made, although alterations in Nos. 1, 2, 5 and 7 should be made with caution. It may so happen that if all insect-eaten wood is removed, the tree may be dangerously weakened; under such conditions the diseased matter can be removed to solid wood and the cavity fumigated. Other suggestions along these lines may be found in the pamphlet issued by the department.

The department realizes that this science is comparatively new and that methods in the near future may be developed that will prove far superior to some now in common use. It therefore invites correspondence either from individuals or firms concerning new methods of treatment, and is prepared to advise regarding any particular method so far as experimental results will permit. The co-operation of all who are interested is necessary for this work. All interested are urged to write for the new bulletin.

Fall Plowing

Fall plowing possesses many advantages in the greater part of the agricultural area of Washington.

(1) Fall plowed land left rough will absorb the winter's precipitation much more completely than a firm surface. This advantage is very important, except in some of the regions of heavy rainfall in Western Washington.

(2) The winter's rain and snow will settle the furrows, shutting out excessive air space and restoring capillary connection with the soil beneath. This puts the soil in better shape for rapid and extensive root development and greatly lessens the danger of the furrows drying out if much manure, stubble or other refuse has been plowed under. This settling of the furrows accomplished by nature is more effective and costs less than the firming of spring plowing done with compacting tools.

(3) The weathering of the loosened furrows improves the physical condition of heavy soils and aids in the liberation of latent plant food. The immediate yielding power of a given piece of land is not determined by the amount of plant food actually stored in the soil, but by the amount of plant food that can be made available to the immediate crop. One of the leading purposes of tillage is to encourage the development of available plant food in the soil.

(4) In the hilly sections land plowed on contour lines in the fall and left rough is less apt to wash and gully than the same soil left with a firm surface. This is becoming an important consideration in the grain belt in most cases.

(5) Fall plowing economizes time and labor by utilizing teams and equipment that would otherwise be idle, and relieves the usual congestion of spring work. This usually gives time for better soil preparation in the spring. In most cases it is probably better not to fall-plow land that is to be summer fallowed, but instead disc the surface. Discing in the fall will give the benefits of fall plowing in a minor degree. Summer fallow land is usually apt to become too compact by the spring after seeding if it is plowed the fall before summer fallowing. It is also usually best not to fall-plow a leachy soil in a wet climate.

In general, however, it is usually desirable to fall-plow for spring crops in most parts of Washington, except where the spring seeding is done on summer fallow. We would urge those who have not practiced fall plowing for spring crops to give the practice a small trial this fall. Land may be given a deeper plowing in fall than in spring with good results.—George Severance, Agriculturist, Washington State College.

New Soil Acidity Test

What is expected to prove a more positive test for soil acidity than the common litmus paper test, and one which, because of the cheap and harmless chemicals used in its operation, will be within the reach of the ordinary farmer has been devised by E. Truog, instructor in the department of soils, College of Agriculture of the University of Wisconsin.

The new test, it is believed, will be of especial benefit to county representatives and to field agents of the state soils laboratory, owing to the fact that it is simple to operate and can approxi-

mate quantitative results can be secured in from ten to fifteen minutes.

The new method consists of the addition to a sample of soil to be examined of zinc sulphide with small amounts of calcium chloride and water and boiling the mixture in a flask held over a small flame, preferably an alcohol lamp. Commercial lead acetate paper, which can be purchased at the drug store, when held in the fumes of the mixture for a few minutes, will turn from light brown to a shiny black, according to the degree of acidity present in the soil. The natural color of the lead acetate paper is white, hence the discoloration can be plainly seen and will more accurately gauge the acidity in a soil than will the litmus paper test, now in use.

The chemicals are perfectly safe for the layman to handle, and the complete apparatus, including flask and burner, ordinarily will not cost more than two dollars. The details of the apparatus have not been completed, but in a short time a more definite announcement will be forthcoming.

Owing to the prevalence of sour or acid soils in Wisconsin, and the desirability of adding lime as a corrective before raising legumes, any improvement over the present methods of testing for soil acidity will be welcomed. —Exchange.

Committees for Washington State Horticultural Society Meeting

The following is a list of the different committees appointed by Mr. Mike Horan, president of the Washington Horticultural Society for the state meeting which will be held in Wenatchee in January: Executive, M. Horan, Wenatchee; H. C. Sampson, Spokane; J. Howard Wright, North Yakima; P. H. Weyrauch, Walla Walla; R. Edward Trumble, Wenatchee. Transportation and markets, H. M. Gilbert, North Yakima; Clay Fruit, Tanasket; W. L. Sanders, Seattle; E. C. Burlingame, Walla Walla; W. H. Paulhamus, Sumner. Legislation, E. F. Benson, Tacoma; C. L. Whitney, Walla Walla; M. N. Richards, North Yakima; A. F. Crowell, Spokane; H. W. Otis, Peshastin. Membership, J. T. Compton, Wenatchee; W. A. Ritz, Walla Walla; F. E. DeSellem, North Yakima; C. L. Smith, Spokane; Ira D. Cardiff, Pullman. Better rates and shipping facilities, Charles Uhden, Spokane; W. P. Sawyer, Wapato; W. S. Offner, Walla Walla; C. N. Crewdson, Brewster, and Conrad Rose, Wenatchee. The minutes of the last annual meeting, held in Walla Walla in December, 1913, are now ready for the press and will be distributed to members of the association in a short time.

Books on Horticulture

Published by the Pacific Horticultural Correspondence School, 306 Stock Exchange Building, Portland, Oregon. For sale at following prices, paper binding, postpaid on receipt of price. Mention "Better Fruit" when remitting.

Practical Control of Apple Diseases and Pests. A. L. Melander, B.S., M.S., Head Dept. Zoology, Washington State College. 44 pages. 50 cents.

Planting Fruit Trees. H. C. Atwell, ex-president Oregon State Horticultural Society. 22 pages. 25 cents.

Care and Cultivation of the Orchard. (a) W. K. Newell, president Oregon State Board of Horticulture. 14 pages. 20 cents. (b) J. R. Shepard, ex-vice president Oregon State Horticultural Society. 7 pages. 10 cents. Both for 25 cents.

Grading and Packing Fruits for the Market. A. P. Bateham, ex-president Oregon State Horticultural Society and vice president Northwest Fruit Exchange; John M. Carroll, for four years in charge of packing school National Apple Show. Includes packing of apples and prunes. 16 pages, 6 illustrations. 25 cents.

Handling and Pre-Cooling of Fruits for Transportation. A. V. Stubenrauch, Field Investigations in Pomology, U. S. Department of Agriculture. 27 pages. 50 cents.

Irrigation Practice. W. L. Powers, M.S., professor Irrigation and Drainage, O. A. C. Many valuable tables of water measurement, amount needed, etc. 78 pages, 8 illustrations. 50 cts.

Water Rights. John H. Lewis, C.E., LL.B., State Engineer, president Board of Control of Water Rights, Salem, Oregon. 16 pages. 20c.

Apple Growing. W. H. Lawrence, A.B., M.S., Horticulturist and Plant Pathologist formerly with Washington State College, now Horticulturist Arizona Experiment Station. 31 pages. 50 cents.

Pear Growing. C. E. Whisler, president Oregon State Horticultural Society. 13 pages. 25c.

Pollination. E. J. Kraus, B.S., Research Assistant in Horticulture, O. A. C. 15 pages. 35c.

Orchard Heating and Frost Prevention. R. S. Herrick, B.S., Field Horticulturist Colorado Agricultural College. 11 pages. 25 cents.

Small Fruits. Fred T. Burglehaus, expert small fruit grower. 16 pages. 25 cents.

Loganberry Culture. Britt Aspinwall. With recipes by Professor C. I. Lewis for loganberry juice. 16 pages, 3 illustrations. 25 cents.

Prune Growing. H. S. Gile, Secretary Willamette Valley Prune Growers' Association. 6 pp. 10 cents.

Cherry Growing. J. R. Shepard, ex-vice president Oregon State Horticultural Society. 7 pages. 10 cents.

Directions for Orchard Spraying. H. S. Jackson, Plant Pathologist, and H. F. Wilson, Entomologist, O. A. C. Free with any order of 35 cents or more. 8 pages. 10 cents.

Walnut Growing. Ferd Groner, walnut grower. 9 pages. 15 cents.

Co-operation Among Fruit Growers. E. H. Shepard, Editor "Better Fruit." 8 pages. 10c.

All of the above booklets, in paper covers, will be sold for $3.00, if ordered at one time; but costing $4.90 is ordered separately.

The following booklets are also in course of preparation by the authors. The exact price cannot be stated for each until received, but will be approximately 75 cents each and will contain from 50 to 100 pages each.

Orchard Insect Pests and Methods of Control. H. F. Wilson, M.S., Entomologist Oregon Agricultural College. About 100 pages, illustrated. 75 cents.

Fungous and Bacterial Diseases of Fruits and Their Treatment. H. S. Jackson, A.B., professor of Botany and Plant Pathology, Oregon Agricultural College.

Choosing an Orchard. C. I. Lewis, M.S.A., head Department of Horticulture, O. A. C.

Soil Fertility and Fertilizers. Herman V. Tartar, B.S., Chemist, O. A. C.

The complete set of above booklets will be sold for $5.00. The new booklets to be mailed as soon as published.

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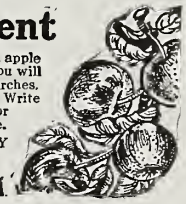

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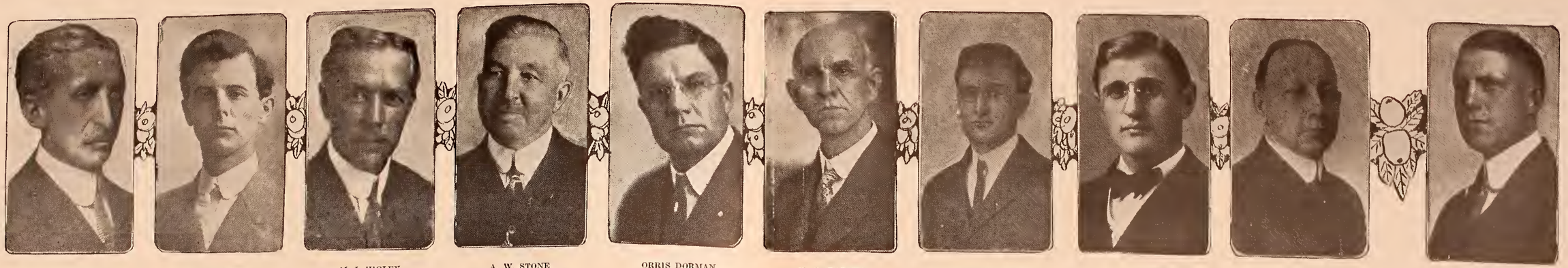

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Colegiate Work in Horticulture

By R. J. Barnett, Pullman, Washington

DURING the past twenty-five years one of the most significant changes in higher education has been the rise in importance and popularity of the agricultural and engineering courses. The leaders in this development, especially along the agricultural lines, have been the so-called land-grant colleges. In the earlier part of the period, those established as separate institutions were much more effective than were the colleges of agriculture as a part of a state university. Thus Iowa, Michigan and Kansas, with their independent agricultural colleges started the work at an earlier date and developed it much more rapidly than did most of the states which incorporated the college of agriculture as a part of the state university. It is not possible here to trace the evolution of the various lines of instruction—how engineering has been subdivided, and how agriculture is now agronomy, soils, animal husbandry, dairying, veterinary science, horticulture, and in some schools, poultrying even, is made the basis of work leading to the bachelor's degree.

It is natural that among the various courses in agriculture, the agronomy and animal husbandry should have been the earliest to develop and to be offered as the technical portion of a well-rounded liberal education built on university entrance requirements and demanding as great natural ability of those who successfully pursue them as do the arts or engineering courses. Horticulture as a separate course has been of later growth, but has, in several schools, become the most completely developed of any of the agricultural group. This complete and rapid development has naturally been found in those states where the growing of the horticultural crops is an industry of considerable magnitude; New York was early a leader, Michigan and Massachusetts followed quickly, and among the far western schools Oregon, Washington and California now give as complete work in this line as can be found elsewhere.

An interesting investigation would be that of tracing the evolution of these curriculums from that originally offered under the one name agriculture, and often taught wholly by one man; but a more valuable discussion would be one regarding what a present-day course of this type offers. Is the man who finishes such a course really educated? Does it fit the graduate for the practice of his profession? Does he make a better citizen of the state? Is he prepared to do original investigative work along his chosen line? The affirmative answer which can be given to each of these questions assures us of the value of the work offered, and that the various states and the United States are getting adequate returns for the expenditure they make in supporting the schools giving such instruction.

The basic idea of agricultural education is that while remaining liberal and cultural it must also connect with the future vocation of the student—must actually assist in preparing him for his life work in additional ways aside from the mental training which the classical course of study offered. He is to be educated—but educated for a life of work, which, fortunately, is the common lot, instead of for a life of leisure. This idea has ever been foremost in framing the curriculums of the various courses of horticulture so that those of today are a well-balanced combination of studies selected from three general groups, but all tending toward and giving their assistanse to preparing the student along the lines suggested by the preceding paragraph.

The first of these three groups may be called the cultural studies—those which serve to give a measure of polish and world knowledge to the student, and which contribute only indirectly to his mastery of technical knowledge. English language and literature perhaps belong here, and certainly are of practical as well as of cultural value. History and economics fall under this category as does also the study of modern language which is commonly required. Without a thorough knowledge of English the student can be proficient in neither the gathering nor the expressing of learning of any kind; without history and economics his equipment for civic leadership is incomplete; without a language other than English he finds the door to much valuable knowledge regarding his specialty closed, and he cannot obtain a proper perspective and sympathy relative to foreign peoples.

The second group is the largest and in many ways the most important. It might be termed the fundamental science group. It includes such sciences as chemistry, physics, botany, geology and zoology with numerous subdivisions of many of them. Under chemistry it is usual to require the inorganic, organic and agricultural branches—the latter relating largely to the chemistry of soils and fertilizers. The physics of the soil is studied as well as the physics of sound, light and electricity. Botany probably exceeds any other of this group in value for the horticulturist, and is subdivided into a polygenetic study of the plant kingdom, taxonomy, physiology, bacteriology, ecology and pathology. A geological study of the earth gives much information regarding the origin and composition of the rocks and soils forming its surface and the agencies—atmospheric, aqueous, igneous and organic—which supply the force to perform the work involved in geological changes. General zoology is interesting and valuable to the student of horticulture, but entomology claims his particular attention, special study being bestowed upon the life history and methods of control of those insects which are of economic importance—those which attack fruit plants.

Group three comprises the technical lines of study followed by the student and in horticulture fall into three more or less distinct divisions; pomology, or fruit growing; olericulture, or vegetable growing; floriculture, or flower and ornamental plant growing. Many schools include landscape gardening in the horticultural courses and a few continue to place forestry there, but these seem likely to be raised to the importance of separate departments as rapidly as the number of students calling for them will justify the expense.

Pomology is the most thoroughly worked out of these divisions and will be used to illustrate the order and method of study followed. The propagation of plants is frequently the first of the technical studies and involves knowledge pertaining to the production of new individuals of known variety by seedage, separation and division, layerage, cuttage or graftage, to use Professor Bailey's outline. Practical pomology is the name given that group of studies having to do with the production of the fruit, including choice and preparation of the site, laying out and planting the orchard, cultivation, spraying, pruning, thinning and harvesting. In the past this side of the work has been empasized to the neglect of that which is known as commercial pomology or the marketing of the fruit grown. Commission house, f.o.b. sales and association methods of selling are now taught the student with considerable thoroughness. The third subdivision, systematic pomology, deals with the botany of the fruit plants and with the description, nomenclature, history and classification of the principal varieties of the various kinds of fruits.

Pomological plant breeding is usually a required study, as are also the literature of pomology, biographies of noted pomologists and a certain amount of research work on problems of special interest to the fruitgrower. The course for those desiring to specialize in vegetable or flower growing is quite similar in scope, but with these plants substituted for the fruits and the construction and management of greenhouses added.

A graduate, having completed such a course, is ready for the battle of life—he has a large store of practical, everyday knowledge, and a foundation on which he may later build a beautiful structure in the way of a life rich in the appreciation of the beautiful in art and nature, of lasting benefit to his state and of work glorified by a love for it and for all growing things.

A Typical Curriculum

FRESHMAN YEAR

First Semester
Propagation of Plants.
Inorganic Chemistry.
English Composition.
Botany (Lower Plant Forms).
Geology.

Second Semester
Fruit Growing (Practical Pomology).
Organic Chemistry.
English Composition and Literature.
Botany (Flowering Plants).

SOPHOMORE YEAR

First Semester
Home Landscape Gardening.
Soils (Physics).
Agricultural Chemistry.
History.
Botany (Plant Physiology).

Second Semester
Vegetable Gardening.
Trigonometry and Surveying.
Economics.
Botany (Plant Pathology).

JUNIOR YEAR

First Semester
German or French.
Systematic Pomology.
Botany (Plant Pathology).
Elective.

Second Semester
German or French.
Commercial Pomology.
General Zoology.
Elective.

SENIOR YEAR

First Semester
German or French.
Advanced Pomology.
Entomology.
Elective.

Second Semester
German or French (Scientific).
Pomological Research.
Plant Breeding.
Elective.

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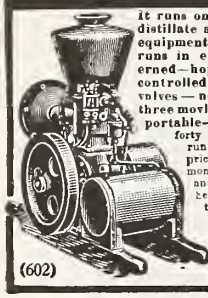

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How They Do It in New York

Under date of August 25, 1914, Mr. Calvin J. Huson, Horticultural Commissioner of the State of New York, issued instructions regarding the handling of this year's apple crop as follows:

To facilitate the marketing of the present apple crop in accordance with the provisions of Chapter 418 of the Laws of 1914, I, Calvin J. Huson, as Commissioner of Agriculture of the State of New York, by virtue of the authority conferred in said chapter, hereby adopt and promulgate the following rules and regulations for guidance in the enforcement of said act:

(1) All apples packed in New York in closed packages must be marked as required by Chapter 418 of the Laws of 1914, except those that are packed and marked in accordance with the provisions and requirements of the U. S. Apple Grading Law (Public Document 252).. If such apples so packed are classified they must be true to the classification.

(2) Apples in "open-headed barrels," baskets or boxes covered with burlap or slats that can be readily removed and replaced are not closed packages within the meaning of the statute.

(3) Transportation companies are not liable under this act for handling apples not properly marked or packed.

(4) Where absence of high color in apples is due to sectional or seasonal conditions, such apples will not be deemed to lack "good color for the variety."

(5) Pasters may be used to mark barrels.

(6) All marks on barrels must be in block letters and figures not less than one-half inch, unless apples are packed under the U. S. Grading Law, in which case they should not be less than one inch.

(7) All closed packages of New York grown apples must be marked as required by section 2 of the law, which calls for the name and address of the packer, the grade or class of the pack, the name of variety and the minimum size of the fruit. If the apples are not hand picked or are fungous or scabby or wormy or diseased, the package should be so marked as to show the facts. If the apples are not classified the package should be marked "unclassified." If the variety is not known the package should be marked "unknown."

(8) Apples sold by the grower, "orchard or tree run," for repacking, resale or transportation are exempted under section 13, but when such apples are repacked for sale or removed from storage for such sale, they must be marked and graded as provided.

(9) Conspicuous violations of the law consist (a) in failure to mark packages as required by sections 1, 2 and 3; (b) where the contents of closed packages do not conform to the external markings.

Northwestern Apples in San Francisco

A few boxes of Northwestern apples exhibited at the California Apple Show in San Francisco by F. A. Frazier, in conjunction with the soluble sulphur spray exhibit of the Charles H. Lilly Company, attracted much attention. There were McIntosh Reds from Bitter Root, Montana, Rome Beauties from Weiser, Idaho, and Jonathans from Twin Falls and Weiser, also from the Yakima Valley and Hood River. Apples handed to interested visitors and friends by Mr. Frazier resulted in many inquiries as to where to buy such apples. The satisfaction expressed by many who had an opportunity of tasting these splendid apples suggests the great advertising value of tasting as well as seeing. Possibly we have missed much of the real advertising value of our apple shows by not having a provision whereby the best apples could be sampled. It is estimated that from 20,000 to 30,000 people visited this apple show each day of the eleven it was open. Few got out without seeing the Northwestern apples, and many were the expressions "These are the best apples in the show."

Apple Boxes

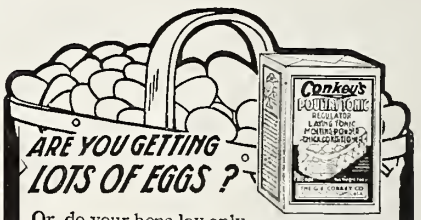
Growers who have not placed their orders are NOW liable to require RUSH SHIPMENTS. The product of a dozen mills is at the SERVICE OF OUR CUSTOMERS. WE CAN SHIP QUICK.

All Western Soft Pine

Write us at once, and let us get your order on file, so you can wire to Rush Shipment when you know just what you will need.

Western Pine Box Sales Co.
614-615 Empire State Building
SPOKANE, WASH.

Mention "Better Fruit"



Or, do your hens lay only when eggs are cheap?

Get the eggs this winter by starting to feed

CONKEY'S POULTRY TONIC

now. It doesn't force the hens but makes them want to lay because they are well nourished and strong.

Conkey's Poultry Tonic is an all round tonic that helps nature do its work—For this reason it is fine for every bird you own—young chicks, growing stock, molting fowls or laying hens.

Tell your Dealer you must have Conkey's—and write us if he cannot supply you. Remember, Money back if a Conkey Remedy or Tonic ever fails to satisfy you.

GET THIS BOOK—and learn to laugh at poultry diseases. It will make you an expert. Send 10c for a copy and we will enclose our Cash Value Coupon—something new.

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Apples, Peaches, Pears

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Fruits As Food and Medicine

By Dr. H. Benjafield, Moonah, Hobart, Tasmania

FRUIT such as the apple, pear, orange, etc., is so essential to our well being that it is a great mistake to look upon it as a luxury to be used only on special occasions. It is of all foods one of the most essential. It is not only a food itself, but it assists in the digestion and assimilation of all other foods. I will try to explain some of its actions as it goes through the body.

As food cannot be digested or assimilated unless it is well broken into fine particles, the teeth have been provided by nature for the purpose, and the health of the whole body very largely depends on the efficiency of this grinding mill. And it has lately been proved that fruit eating provides the teeth with food and prevents their decay; so that in a prize essay of the Royal College of Surgeons, England, Professor Pickerill, who is the professor of dentistry in the University of Otago, writes under date 1912 the results of experiments extending over several years, all of which go to prove in his own words that "children's teeth, in whom caries was commencing, not only have no more carious cavities, but those that were present have passed into a state of arrested caries, and the surface becomes quite hard." And this he proves resulted from giving the children fruit, say, an apple or an orange (the apple proved best) after each meal. He found that the acid in the fruit increased the flow of saliva, and the phosphate of lime, when liquefied in this acid, passed into the child's tooth, and hardened the enamel and prevented caries. He says: "It is of the very highest importance that particular care and attention should be paid to the preservation of the first teeth, as decay in these produces defects in the enamel of the permanent teeth. The enamel is first soft and hardens after cutting by the passing of lime salts out of the saliva into them, and enamel of the highest resistance should be cultivated in children." How, then, are we to produce good teeth in our children and protect them during life? He has pub- a large book on "Dental Caries," from which I will give a few extracts: "In saliva is provided a perfect mouth wash; all its constituents are of value and importance in protecting the teeth, and natural organic acids (such as are found in fruit) are the stimulants which excite the greatest amount of these protective substances." The material most destructive to teeth is fine flour in a cooked state. In an experiment white bread in one week made the enamel of a tooth quite soft, but when, after eating such bread, it was followed by eating an apple the mouth was quite clean. Thus straches and sugars should on no account be eaten alone, but should in all cases be eaten with, or should be followed by, fruit, * * * as the juice of the fruit gets over the teeth and between them, preventing fermentation of these starches and the formation of lactic acid, which is the great cause of dental decay. * * * Chocolates produced a large amount of this destructive acid, but when the chocolate was followed by an apple the mouth was neutral." "Fresh fruit and salads should be used as much as possible at every meal and all meals should end with some acid food."

Saliva is a very complicated fluid, which flows into the mouth in ever-varying quantities, and has much more to do with our comfort and health than is generally supposed. Starch, as found in bread, is our principal food, and the saliva digests it by converting it into sugar before it passes into the stomach.

The Biggest Apple Dealers in California

WRITE OR WIRE US FOR DETAILED MARKET INFORMATION

A. LEVY & J. ZENTNER CO.

Davis Street (from Washington to Oregon Sts.) San Francisco, California

SHIPPERS OF APPLES PEACHES PEARS PLUMS CHERRIES ETC.

When wishing to use the Cleveland market, or desiring reliable information concerning same, write or wire us. We are among the largest receivers here.

SPECIAL FEATURES:

Absolute responsibility, reliable and prompt serviee. No house in any market exeels us in making prompt remittances when goods are sold. Liberal and eonsistant advanees made on eonsignments. Ample eold and dry storage facilities.

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Bean Power Sprayers

While Bean Power Sprayers are very reasonable in price — our idea has not been to build a "cheap" line—but rather to put out a line of outfits as complete and perfect as possible.

We've not slighted them in any particular—but wherever quality could be built in, we've put it in. The result is that the Bean line is recognized as the standard line wherever sprayers are used.

Here Are Some of the Distinctive Bean Features

Bean Patented Pressure Regulator, Rustless Ball Valves, Porcelain-lined Cylinders, Bean Refiller, Bean One-Piece Steel "I" Beam Frame. There are many others. If you're interested in sprayers

Send for Our Catalog 28-A

It illustrates and describes our entire line of Hand and Power Outfits, Pump Accessories, etc. A post card will bring it.

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Bean Spray Pump Co.

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Deliveries made from centrally located Northwest points

Ground Phosphate Rock

The Natural Plant Food and Permanent Soil Builder

1,000 pounds per acre once in each four years will cost about $1.00 per acre per year. At Pennsylvania State College $1.05 invested in Rock Phosphate gave increased yields of $5.85—over 500%. At Maryland Experiment Station $1.96¼ gave $22.11—over 1,000%. At Ohio Station each dollar paid for itself and gave $5.68 profit. At Illinois Station $2.50 gave the same return as $250 invested in land.

Each ton contains 280 pounds of phosphorous, not rendered available artificially by high-priced destructive acids, but so finely ground as to become available in nature's own way.

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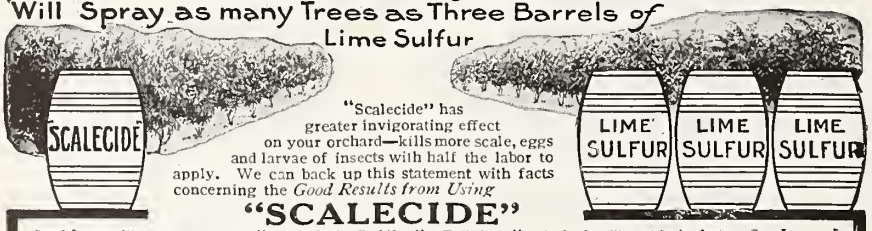
One Barrel of "Scalecide"

Will Spray as many Trees as Three Barrels of Lime Sulfur



"Scalecide" has greater invigorating effect on your orchard—kills more scale, eggs and larvae of insects with half the labor to apply. We can back up this statement with facts concerning the *Good Results from Using*

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Send for our illustrated booklet—"Proof of The Pudding". Tells how "Scalecide" will positively destroy San Jose and Cottony Maple Scale, Pear Psylla, Leaf Roller, etc., without injury to the trees. Write today for this FREE book and also our booklet—"Spraying Simplified".

Our **Service Department** can furnish everything you need for the orchard at prices which save you money. Tell us your needs.

We are World Distributors for **VREELAND'S "ELECTRO" SPRAY CHEMICALS** and **Arsenate of Lead Powder** (33 per cent), which, used wet or dry, has no equal in strength or texture. Avoid imitations.

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But the saliva also keeps our mouth moist and allows us to swallow dry food, and the more plentifully this is mixed with the food the more easily can the stomach deal with it. But Professor Pickerill has shown that when an apple is eaten the quantity is very much increased and the power for digestion quadrupled. Hence eat slowly, so as to mix into the food plenty of saliva, and eat apple with bread and butter.

Dr. Abramowski, in his book on "Eating for Health," describes how, when his digestion and health were so bad that he had abandoned all hope, he decided to try a raw fruit diet, with a few cooked vegetables. He took five pounds of fruit a day, with some vegetables, but no meat or starch. He says: "I was quite free from indigestion and had not an ache or pain. I have now only a desire for natural food. My power to work and pleasure in life is growing, and I can perform tasks quite impossible a few years ago. My teeth have got clear of all the accumulated tartar and have stopped decaying. I have lost none since I started the fruit diet, nor have I had a toothache. I claim that fruit diet has made me young again." Most people are satisfied with a diet in which fruit occupies quite a minor part, such as the society dinner, followed by dessert or apple pie after roast duck, or the inevitable apple sauce with our Christmas goose, but in all this there is sound common sense. Ripe fruit after dinner cleans the mouth, saves the teeth, and in the stomach assists digestion. Apple sauce with fat goose is scientifically correct, as the acid of the apple assists in the digestion of the fat. When I feel indigestion after dinner, I eat two or three pears or apples and get more relief from it than from any other remedy. I make a point of eating fresh fruit after dinner, and I think my gouty pains are better when I eat plenty of fruit, which is quite in keeping with up-to-date medicine.

The digested food passes directly into the blood, and every part of the system is fed and influenced by it, and the good effects of fruit here are being more and more understood. When fruit is withheld for some months, as it used to be on ships at sea, the blood broke up and the body became putrid, even to rotting away. Then, as soon as fruit was given, the blood grew natural and health returned, and, as nearly all our diseases arise from some impurity of the blood, there can be no doubt but fruit exercises an influence on it. Rheumatism and gout are due to uric acid. Modern medicine is satisfied that fruit juice in the blood assists in clearing out this poison. A man had purpura and was bleeding from every pore. I sent him a box of pears and in a few weeks he was well. When the Japanese coal heaver is used up by hard work, he eats an apple with a handful of rice and goes on again, stimulated and strengthened. I am quite sure that eating fruit greatly assists nature in the manufacture of good, healthy blood, such as im-

parts to the face a rollicking, robust appearance.

Fruit contains lime in such a soluble condition that the bones easily take it up and are fed by it. Professor Pickerill shows how in this form it penetrates and feeds the enamel of the teeth, which is the hardest part of all our bones. I live in a large fruit-growing district, where the children eat much fruit, and I have never seen any ricketts or other indication of soft bones since I came here.

If a horse is fed on, say, fine oatmeal or fine flour alone it will soon die of constipation, but if the straw on which the grain grew is cut into chaff and fed with the flour or meal its digestion and bowels will act perfectly. Modern habits of feeding us are wrong in this way; the bowels of the horse need the chaff to induce them to keep up their action, and our bowels require some such stimulant. Dr. Abramowski tells us that when he lived on fruit he had "two or three easy motions a day." And I have every reason for gratitude to fruit, for I have not taken a dose of aperient medicine for forty years, but I get some trouble if I do not get two or three pears or apples a day, or some other fruit, but pears are the most laxative. Professor McAlpine has shown that the best part of an apple or pear is the skin, and if washed or carefully wiped it certainly is better for constipation to eat skin and all. The pulp of roast apple is far better for an infant than castor oil, and if the public spent on fruit half what it now spends on nauseous petroleum, many faces would wear a more cheerful aspect.

As a medical officer of health over a large fruit-growing district in Tasmania, I have for years been able to show a much lower mortality than in districts where fruit is not grown; indeed, our mortality in Glenorchy of four in 1911, five in 1912 and six in 1913 in the thousand is, so far as I have heard, the lowest recorded.

Dried Fruits Reasonable in Price

Numerous studies made of nutritive values by the Office of Experiment Stations have shown that dried fruits may be termed an economical article of diet. Fruit products in general contain little protein, but as sources of energy, derived almost entirely from their sugar, dried fruits are decidedly cheaper than meats and compare favorably with dairy products. They are, however, more expensive than cereals and the starchy vegetables such as dried beans and potatoes. Under no circumstances should fresh and dried fruits be thought a luxury, since they supply the needed nutritive material as an integral part of the diet, besides adding to the attractiveness of the daily fare. If they are to be eaten raw, brands made and marketed in a cleanly way should be obtained. The amount of dried fruit produced in the United States increased 575 per cent between 1899 and 1909.

Are NOW manufactured in California and with full knowledge of conditions necessary for best SUCCESS in Western Orchards. Distributing warehouses in principal fruit growing sections of Northwest, for—

Lime Sulphur Solution
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Arsenate of Lead, Paste
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Visit the ORCHARD BRAND Booth at National Apple Show in Spokane and see these products.

Bulletin No. 3—DORMANT SPRAYING OF DECIDUOUS FRUIT TREES, just published, sent free on application.

General Chemical Company of California
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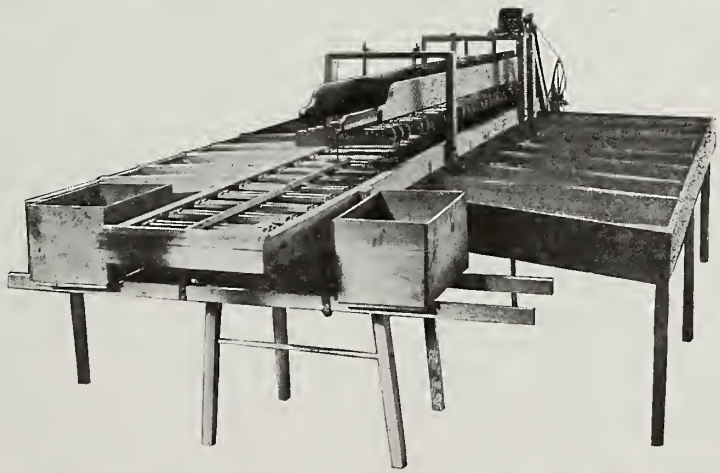
The Pride of Oregon Apple Sizer



Is the most simple and economical sizer on the market today. Experience has demonstrated that sizing to eight divisions is more practical than a greater or less number of divisions and enables packers to pack the maximum quantity per day, thereby reducing the cost.

The sizing is done ABSOLUTELY WITHOUT BRUISING.

The sizer is strongly and simply constructed, with no complicated machinery to get out of order, and will last a lifetime.

The machines will make two grades at the same time and divide each into eight sizes.

The construction is so simple that the machine can be operated with 1/30-horsepower motor—either electricity, gasoline engine, or by hand.

For particulars address

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J. R. NUNAMAKER & CO. HOOD RIVER, OREGON

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Not a portable, but a permanent, substantial and attractive home. We furnish the lumber, trim, windows, doors, cut and numbered to fit our plans. Follow the plans with your hammer.

No building experience necessary. All hardware, nails, paint, stain, plaster or interior wall-board furnished with plans.

Your own ideas carried out. Satisfaction guaranteed. Illustrated Catalogue FREE. Write today.

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BUY DIRECT FROM THE MANUFACTURER and Save $50 to $300 on Gasoline Engines

That comes about as near keeping your money at home as any way you can think of. Write me before you buy.

FREE Service Department that will help you select and install the best style and size engine you need for your work without cost to you. Let me send you my New 1914 Special Offer. Just write for my catalog and new, low prices today.

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Portland, Oregon

California produces more than four-fifths of the yearly output. According to a very rough estimate, each person in this country consumes on an average five or six pounds of dried fruit a year. The value of the product rose from between four and five millions to over twenty-one millions in ten years. The average wholesale price, however, has not advanced with the increased demand; on the contrary, it has dropped from about 5½ cents to about 4½ cents per pound. Dried fruits are especially useful when the supply of fresh fruits is limited or where storage space for fresh fruits is lacking. Besides being used alone, they may be added to cakes, puddings, confectionery and other similar dishes. They afford a nutritious and economical way of securing a variety of diet which is often overlooked by the housewife.—Office of Information, U. S. Department of Agriculture.

Canned Fruits and Vegetables in Winter Diet

The balanced ration of many Americans today is made up something as follows: Bread, butter, eggs, meat, fish and potatoes, and patent medicine laxatives.

Many Americans customarily suffer from one of the following complaints: Indigestion, constipation, rheumatism. A simple change of the daily menu might go a long way to remedy these ailments, according to the Bureau of Plant Industry's specialist in charge of canning club work. This specialist recommends a change to a menu more in keeping with nature's plans something as follows: Bread, butter, meat, fish and eggs, and fruit, vegetables and greens.

He recommends that every family provide a diet of fruit and vegetables for every day in the year. This would do much to eliminate the need for patent medicine laxatives that figure so prominently in many Americans' bills of fare. If every home kept on hand enough canned products so that there might be a can of fruits, a can of greens and a can of vegetables for every day during the winter, there would be little need for the laxatives now so regularly purchased from the corner drug store. There would also be great economy in the substitution of an inexpensive food for more expensive ones.

More home canning, done at the proper season, would enable the average family always to have the proper quantity of canned products, and would save an astonishing amount of food that goes to waste every year. It is estimated that over 50 per cent of all the vegetables, greens, fruits and berries that grow in this country go to waste and are actually lost to those who need them. This is simply because some housewives have not learned to care for these surplus products efficiently and to make them available for the winter months by canning.

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FOR BLIGHT, RUST, SCALE, SCAB, CODLIN MOTH AND ALL APHIS

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To the number of about 1200 species stand ready to attack your orchards; some of them may be busy already, working day and night and costing you hundreds of dollars. MUSTONIA will destroy them and prevent them coming again.

PLANT LICE

Especially on apple trees, aphis are very destructive. MUSTONIA will remove the apple aphis, rosy apple aphis, European grain aphis and the clover aphis, and keep your trees clean and free from rust, scale and scab.

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Spray with MUSTONIA three to four times a year and your trees will be healthy and vigorous. Get your order in early for spring delivery. Write for literature on spraying and tree planting.

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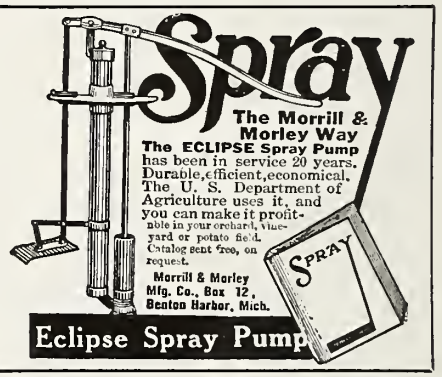

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Eclipse Spray Pump

ACID BLAST ETCHED PLATES

We have installed the only etching machines in the State of Oregon

BLAST ETCHED plates have a Printing Quality which has never before been obtainable with process engraved plates

THEY COST THE SAME AS THE OTHER KIND

OUR DIRECT PROCESS COLOR PLATES ARE EQUAL TO ANY MADE

DRAWINGS for every purpose in PEN AND INK OR WASH.

HICKS-CHATTEN ENGRAVING CO.
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607 BLAKE-McFALL BUILDING
Fourth and Ankeny Sts. PORTLAND, ORE.

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

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It's easy! With a first-class telephone line from home to town you and your neighbors can talk direct to crop buyers every day without driving over those long miles. You can watch the market for top prices—ask the railroad station if your freight has come—order supplies from the store—find out what's doing at the stock yards—set a time with the grist mill for grinding your grain—get the doctor *quick* when you need him. Besides all this, you can talk business or pleasure without leaving your own doors.

Western Electric
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are standard for use on the farm. Thousands are in daily use by progressive farmers everywhere. If you are still without telephone service, write us for information on how it can be secured. Write the nearest house below, and mention this paper.

WESTERN ELECTRIC COMPANY
Manufacturers of the 8,000,000 "Bell" Telephones
PACIFIC HOUSES:
San Francisco Oakland Los Angeles
Seattle Portland Salt Lake City
EQUIPMENT FOR EVERY ELECTRICAL NEED

The Present Status of the Different Varieties of Walnuts

By Dr. W. W. Fitzgerald, Stockton, California

THIS subject is about as difficult as the present status of the different makes of automobiles. Whatever make of machine a man drives he is apt to think that is the best, so with the man who grows a particular variety of walnut, he is apt to think that variety is the best. In speaking of the present status of the different varieties of walnuts we have to consider several things as soil, climate and moisture conditions. It is true that we can regulate moisture conditions, but soils and climate we cannot change; so in considering the different varieties we must keep in mind where they are to be grown and character of the soil they are to be grown on. Some of our best varieties that do well on heavy soil with plenty of moisture will not prove as good a variety on lighter soil and poor moisture conditions; likewise, some varieties that produce good white-meated nuts in a cooler climate will produce inferior nuts in a very hot climate.

The first thing to be considered in judging the different varieties of walnuts is their producing qualities. I do not mean by this a large producer of an inferior nut, but a heavy bearer of a good quality nut. A tree that produces only a few very fancy nuts is not to be considered commercially. A fancy variety may bring a few cents per pound more, and may make up what it would lack in the number of pounds it would produce providing it was not too shy a bearer. A fancy variety producing only from 50 to 100 pounds on full-bearing trees at 25 cents per pound would not compare favorably with a variety which produces 200 to 300 pounds at 12 to 15 cents per pound. The relation between the quality of nuts and the quantity of nuts produced should be carefully considered in choosing a variety for planting. One should not judge variety by the fine appearance of a picked sample of nuts without considering the quantity in which they are produced. The best variety is one that will produce annually a large crop of the most desirable

The J. B. Holt Fruit Picking Sack
(Patented)

I invented this picking sack and have used it in my orchard, handling from five to ten thousand boxes, during the last four years.

I am convinced it is the most practical and convenient picking receptacle on the market. It does not bruise the apples. It is not in the way of the picker, like a bucket. The picker can reach the highest limbs without inconvenience. It empties into the bucket slowly and carefully, without bruising. It has wide shoulder straps like suspenders, and does not have to be hung on the limb with a hook.

You can buy these of

OSCAR HILL, North Yakima, Washington.
C. H. ROSS, Wenatchee, Washington.
S. B. SIMONTON (address Hood River, Oregon), Hood River, Mosier, White Salmon and Underwood.

New agents' names will appear in September issue of "Better Fruit."

Price f.o.b. Pullman, Wasbington, $1,75.

Special prices quoted on large quantities.

For further particulars and illustrated descriptive literature, write

J. B. HOLT
PULLMAN, WASHINGTON

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Cheaper Than Horse Flesh

CATERPILLAR
Reg. U.S. Pat. Off.

HERE'S a tractor that's cheaper than horses, even for your smaller ranch or orchard—the BABY CATERPILLAR. It costs less to feed. It works 24 hours a day if you want it to. There are over 150 of them making good. It's because they're right mechanically. Materials and workmanship are the same as in the other CATERPILLARS—steel cut gears in dust proof cases, a powerful motor. Our reputation is behind the BABY. It stands up under any amount of hard use.

58 inches high without canopy—it works close under the trees in the orchard. It turns short so you can cultivate right from one row into the next. There are all sorts of uses you can put it to—hauling, clearing land, road grading or stationary work. The long, wide track can't slip or mire or pack the soil. You can use the BABY for plowing even after the rains start.

You have time still to do a lot of fall plowing that will pay in better crops than if you wait till springs Now is a good time to order that CATERPILLAR you have been thinking about. Why not get Catalog BE136 and our special bulletin about the BABY? We prove what we say.

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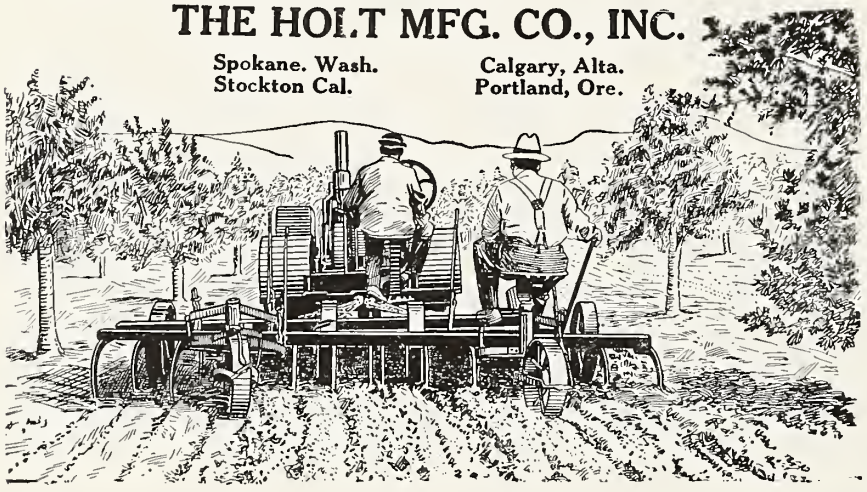

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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

type of nuts. Unfortunately we do not have all the good qaulities in any one variety or we would not be discussing this subject today. We have to choose a heavy producer with a good quality of nut. One important point is that young trees often produce larger nuts than they do after the tree becomes older, so one should judge nuts from a tree that has been bearing for a few years. We should also consider the age in which the tree comes into bearing, as great differences exist in different varieties as to what age they begin bearing. Some varieties begin to produce nuts even in the nursery and give a commercial crop within three years from planting in the orchard, while other varieties are several years later in coming into bearing.

The next important consideration is that of the size and weight of the nuts. The size of commercial number one grade walnuts are those which will not pass through a one-inch square opening, while those above one and three-sixteenths inches, which are generally considered as budded nuts, bring considerable more per pound and the demand is growing for this quality of nut. I have already had a number of inquiries for fancy varieties for next fall's delivery. This shows that the demand is growing for the better quality of nuts. The weight of the nut is equally important, since this varies widely in nuts of the same size. Some of the largest varieties are considerably lighter in weight than others in which the nuts are smaller. A desirable nut should be well filled with plump meat without too much air space between the shell and the meat. A comparatively heavy shell is more desirable than a very thin light one, since the nut is better protected from being mashed in handling and less susceptible to perforation disease, which is one of the most serious troubles of the walnut grower in recent years. It consists of a non-development of the outer hard layer of the shell. The hard shell is not actually perforated but rather fails to develop. This disease has become more prevalent in the last few years and affects principally the one with thin light shells. Nuts that are prone to crack easily, and have a fine light shell, are more or less injured in handling, thus contaminating the nut. It is also to be considered that since walnuts are sold by the pound, the heavier the shell the greater the weight and the more the returns for a given number of nuts. The leading walnut on the world's market is known as the Grenoble. In strictly speaking the Grenoble nut means a Mayette variety. It is not a long nut, somewhat broader at the base than at the apex. This is not very important, however, since its smoothness, symmetry and uniformity affects its productive appearance more than its shape. An ideal nut should be quite smooth, free from outside ridges and other irregularities of surface, and all nuts should be of the same general shape and appearance, giving them uniformity and individuality. A variety in

which the nuts are decidedly uniform so that the variety is easily distinguished and recognized even to the consumer has a marked advantage over one in which the nuts are of all sorts of shapes so that only an expert could distinguish the variety from others. The color of the nut is not so important, as the trade demands bleached nuts even though they may have an attractive appearance without bleaching. By being bleached they are all brought to about the same color. The quality of the meat is of considerable importance, however, as nuts with the lightest colored meats are considerably more desirable, while those that are dark, even though plump and of good color, are discriminated against. There is no doubt but what the dark-meated varieties will become more objectionable as more of the lighter colored ones are produced. The flavor of the meat varies considerably in the different varieties and is of much importance in a high-class fancy trade. Although commercially there is not much importance placed on their flavor except when they are bitter, and this is the most undesirable quality and should be guarded against in choosing the variety and to formulate an idea of what will constitute an ideal walnut. The most important qualifications in a variety from a strictly commercial standpoint is that it should be a uniformly large producer of nuts, the majority of which will not pass through a one and three-sixteenths inch square mesh, well sealed even though hard shelled, and should be uniformly well filled with meat of light yellowish brown color or not darker than light brown or amber. For a fancy trade the nut should be of an attractive, uniform shape and color with a fairly smooth surface and particularly high quality with agreeably flavored meat with no bitterness.

The next important consideration is the choosing of a variety that is resistant to blight. This is a bacterial disease which affects the young growth when it first puts out and requires moist weather conditions for its development. It is not very prevalent in Northern and Central California on account of the drier atmosphere, but under the same conditions some varieties are more blight resisting than others, probably due to their vigor. As a rule the late-blooming varieties are free from blight, as they come into bloom at the time when the blight can make little headway, while the earlier varieties blossom at a favorable period for its development. Certain varieties are spoken of as being immune to the blight, but while there is no such thing among walnuts as absolute immunity when conditions are favorable for the development of blight, yet some trees do show quite a marked resistance and should be given precedence on this account. While there are many seedlings of promise scattered throughout the state, both of the Santa Barbara soft-shell type and the French varieties, I will only consider the prominent

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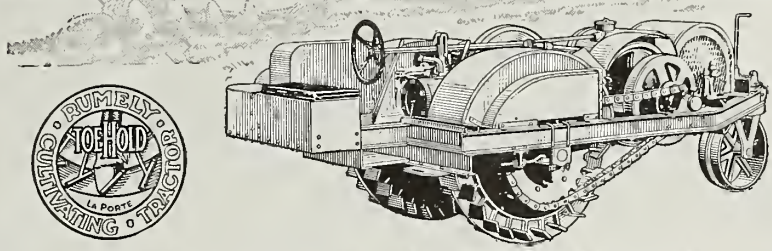

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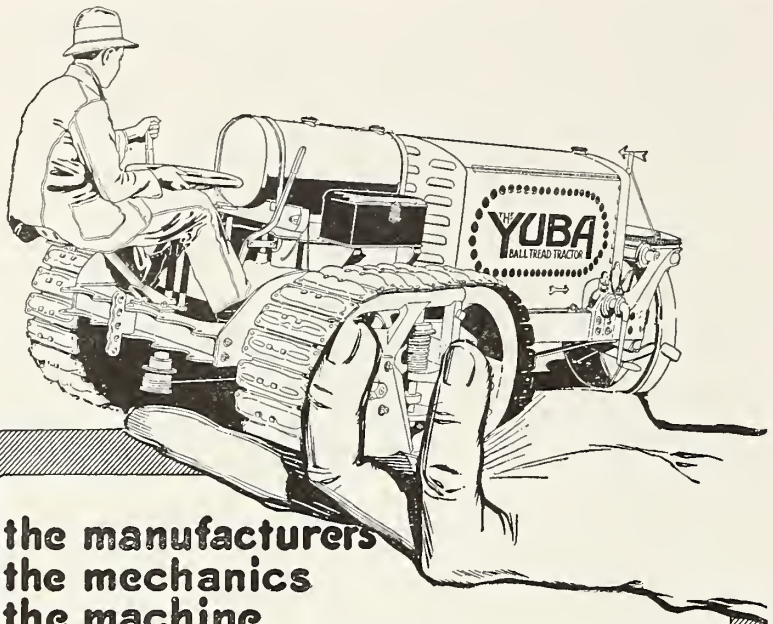

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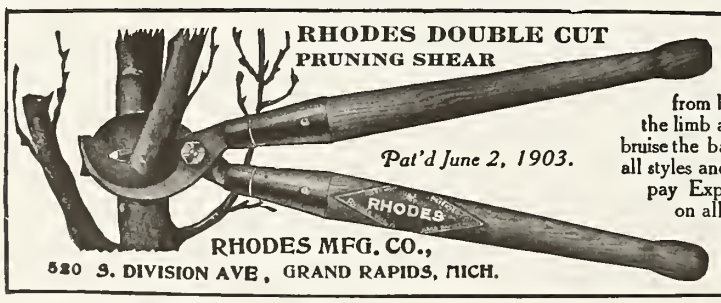

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varieties that have been thoroughly tested:

Santa Barbara Soft Shells.—Originated by Mr. Joseph Sexton of Santa Barbara. It is a seedling grown from a sack of nuts which probably came from Chili. This is the prevailing type of seedling walnuts of Southern California. The nuts vary in size and are irregularly shaped. Trees come out early in the spring, having a growth of six to eight inches by March 20th. The trees vary in their bearing qualities, are very susceptible to blight and are not very desirable for this reason and for their irregular bearing.

Santa Rosa.—A chance seedling introduced by Luther Burbank at Santa Rosa. The tree is a very thrifty grower and very precocious, but the nuts are small on old trees and susceptible to blight, consequently not very desirable.

Placentia. — The Placentia, which originated in Placentia near Fullerton, was extensivley propagated by Mr. J. B. Neff of Anaheim, California. It was a seedling of the Santa Barbara soft-shell type. The nut is of medium size, averaging one and one-eighth by one and one-fourth by one and one-half inches, runs largely to average size; has very few large or small nuts; form is regular and somewhat elongated; the surface is quite smooth and the ridges not very prominent; the nuts are uniform in size but vary considerably in shape and smoothness, some quite elongated, others nearly round, but the shell is thin and strong. The nuts are poorly sealed. The septum is almost free from the shell so that the nut can be very easily opened with the fingers and the whole meat taken out intact. Kernel full size, quite smooth with comparatively few convolutions, averages 50 per cent or more of the total weight of the nut. Flavor mild and pleasant with no pronounced character. The tree makes a vigorous growth and the foliage very abundant and thrifty. The foliation period is quite early, about the same as all Santa Barbara seedlings, having a growth of about six inches by the 8th of April. It comes into bearing early and is a heavy bearer and the harvest season is early. It is very susceptible to blight and the nuts are sometimes very badly perforated.

Ware's Prolific.—This variety also originated from a Santa Barbara soft-shell seedling at Garden Grove, California. This is rather a large nut even on old trees. It is oval, quite elongated and eliptical, base and apex equal breadth, pointed at both ends. It is quite smooth and has conspicuous longitudinal grooves which gives it a characteristic appearance. The nuts are very uniform but poorly sealed, meat is decidedly plump and well filled, averaging about 50 per cent. Flavor is mild and pleasant, but the meat is quite dark, ranging from amber to dark brown, and in many cases nearly black. The tree comes out early in the spring, makes a fairly vigorous growth, forming much fruit wood, which makes the tree low and spreading. It is well filled

with fruit spurs and the foliage is abundant and thrifty. The harvest season is early. It is one of the most precocious varieties we have, coming into bearing when very young. It is subject to blight the same as the other soft-shell seedlings, and very prone to perforations. This nut is worthy of consideration, on account of its heavy and early bearing, as a tree for interplanting for a few years.

Chase.—This originated in a tree near Whittier and has been widely propagated by Mr. Rideout of Whittier, California. This original Chase nut is medium to large size on young trees, but small on older trees. In form it is broadly oval or rounded; apex and base of equal breadth, apex terminating in a short and pronounced point. Surface is quite smooth, nut not so very uniform. They are badly sealed, the meat is plump and well filled, averaging nearly 50 per cent of total weight. Flavor is mild. This tree comes out earlier than the average Santa Barbara seedling. The growth is very vigorous and thrifty and the foliage abundant. The nuts are harvested early and is a very heavy bearer, but is somewhat subject to blight. It is a good type of the Santa Barbara soft shells except that the nuts are small.

El Monte.—A Santa Barbara soft-shell seedling which originated near El Monte, California. It is a somewhat irregular shaped nut with pronounced ridges. The nuts are well sealed and filled with light-colored meat. Comes into bearing early and bears quite heavily. The tree is a thrifty grower, comes out early in the spring, about the same time as the other Santa Barbara seedlings, and harvests early. Its blight resistance is about the same as the other Santa Barbara seedlings. It is desirable on account of bearing early and heavily, but the nut is quite homely.

Neff's Prolific.—The original tree is a Santa Barbara soft-shell seedling in Mr. J. B. Neff's orchard at Anaheim, California. Mr. Neff selected this tree on account of its heavy bearing and not being so subject to blight and perforation as the ordinary seedlings. The nut is of good size, well sealed, exceptionally heavy and well filled with light-colored meat of good flavor. This variety has not been propagated very extensively and is a good variety on account of its heavy bearing, although the nuts are rather rough and irregularly shaped.

Franquette.—The French variety has several types. The one most commonly known as the Vrooman, from the Vrooman grove at Santa Rosa, was first propagated by John Rock at Niles. The Leibs of San Jose are also large growers of the Franquette. The Oregon Nursery Company controlled the scions and nuts from the Vrooman grove for a number of years. This variety, being well advertised and highly recommended, has been extensively planted on the Pacific Coast in recent years, not only as grafted trees but as seedlings. Not being enough grafted trees

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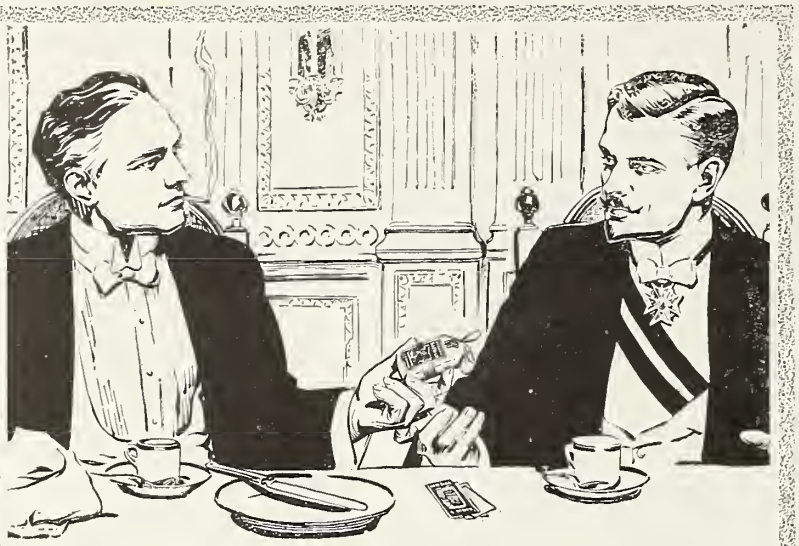

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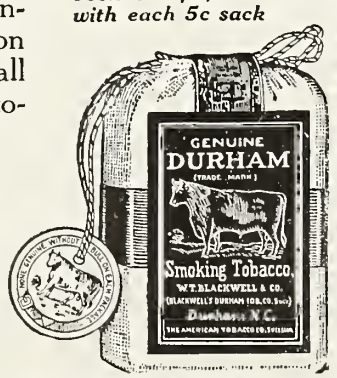

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to supply the demand, many resorted to planting seedlings. The eagerness of planters to set out walnuts causing Franquette seedlings to be planted. Of course the result of this, as with all other seedlings, is going to be variable and disappointing. The Vrooman Franquette nut is medium to large and retains its size on old trees. Decidedly elongated, but pointed base much broader than the apex, surface medium smooth with sutral ridges. The color is a light yellowish brown. Their uniformity is strong and their characteristic shape makes them easy to identify. The nuts are well sealed but thin shelled and are readily cracked. The meat is moderately plump and the shell well filled except at the point of the nut. Flavor is sweet with a characteristic nutty flavor. The consistency of the meat is also soft or oily. The buds just begin to swell about April 15th. The harvest season is late, often being caught by the fall rains. It is a fair, vigorous grower. The precocity is not pronounced. It is one of the slowest of the varieties to come into bearing. Has a thick husk and abundant foliage which protect the nuts from sunburn. It is one of the best proven varieties for Central and Northern California and has been considerably tested. The quality of the nuts is the best. With its uniform shape, pretty color, white meat and firm sealing, makes the Franquette one of the very highest quality, and were it a heavy bearer it would be an ideal nut. I have a couple good types of imported Franquette, however, which are much more precocious than the Vrooman strain.

Mayette.—This, like the Franquette, is a French nut. Like the Franquette, there are several types of Mayette, due probably to being originally propagated in France by seedlings. They differ widely in character, but have a general resemblance. The Mayette, like the Franquette, is characterized by the shape of the nut. In the true Mayette type the base of the nut is decidedly flat and square, cut so that it can be set on the basal without falling over. The nut rounds broadly to a point at the other end, giving it sort of a flat-iron shape. In a good Mayette the meat is plump, white and well developed and of good flavor. It averages about 50 per cent of the total weight. The shell is thin and strong and well sealed. The Mayette comes out late in the spring, about a week or ten days before the Franquette, but ripens at least three or four weeks earlier in the fall than the Franquette. The different types vary considerably in their rapidity of growth and the amount of foliage, also in their bearing qualities, most of them being very light producers. Mr. S. F. Leib of San Jose has some imported trees. There are several types that were imported by the late Mr. Gillet. Tribble Bros. of Elk Grove also propagate two or three types which were imported from France. Mr. Leonard Coates of Morgan Hill has propagated quite extensively San Jose Mayettes, which is one of the most attractive and

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handsome walnuts grown in California. It is of large size, above the average of most varieties. Has a typical Mayette form with smooth surface and uniformity. The nuts are not any too well sealed, has a thin shell and the meat is small in proportion to the shell. This type is of slow growth and scant foliage and not a heavy producer. I have a Mayette imported from France which is most promising, as the nut is a good type precocious and a heavy bearer. If it continues its present standard it will be a leader.

Bijou.—This is also a French variety, having the characteristics of those varieties, that is, coming out late in the spring. As a rule they are very rough and poorly filled with meat and are not considered a commercial nut. There are, however, Bijou seedlings which have smoother and better nuts, such as the Acme, which is fairly smooth, rather elongated at the apex than at the base and almost square in end view. The shell is heavy and it is fairly well filled with meat, averaging about 40 per cent of the total weight. It is not of any special value for commercial purposes. The Klondyke is another walnut of the Bijou type. The Willson Wonder, propagated by F. C. Willson of Sunnyvale, is perhaps the best Bijou type we have. The nuts are very large but smoother and better filled than those of the Bijou. It is extremely precocious, coming into bearing very early. The nut is smooth and symmetrical, being broader at the apex than at the base and nearly square in end view. The flavor is mild and sweet and the meat white. These nuts are very large. They sometimes measure two by three inches. The tree is a slow grower and of scant foliage, probably due to its heavy bearing qualities. It is like the other late varieties, quite blight resisting in dry climates.

Payne.—This nut is an accidental seedling discovered by George C. Payne of Campbell, California. It is of the Franquette type and is an excellent nut. It comes out rather early in the spring. It is a very heavy bearer but blights badly.

Parisienne.—This is a French variety introduced by the late Felix Gillet. The nut is rather long and pointed, somewhat resembling the Franquette but broader in the center. The shell is light, the meat is fairly well filled, light color and a good flavor. Like the other French varieties, it is late in coming out in the spring. This is a very good nut. Its greatest drawback being that it is a light producer.

Concord.—This variety originated in a seedling tree on Mr. George M. Westcott's place at Concord, Contra Costa County, the original tree coming from Felix Gillet. It has been propagated by Leonard Coates of Morgan Hill. The nuts are not large; they are broad and short with a square cut base, slightly wider than the apex and fairly smooth. The nuts are fairly uniform and are well sealed. The meat is plump, white and well formed, filling the shell completely. The tree comes out medium

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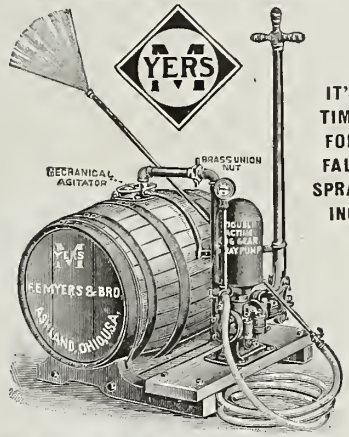

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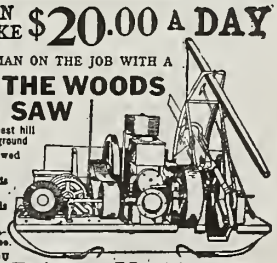

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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

late, midway between the Placentia and the Franquette. The growth is thrifty, although the tree ultimately does not become very large. The nuts are harvested early in the fall. It is a good bearer and comes into bearing early. Like all late varieties, it is fairly immune to blight. This variety seems well adapted to hot sunny regious and light dry soil. It is a very good variety, although the nuts are small.

Eureka.—This variety originated in a seedling tree at Fullerton, California, from nuts obtained near the Meek place near Haywards, California. The desirable quality of this variety was first appreciated by Fischer and Ware of Garden Grove. The nut is of large size, decidedly elongated with parallel sides, apex and base of equal breadth or a little thicker at the apex, rather rectangular or square in end view. It has quite a smooth surface and the sutural ridges are not prominent. They are very uniform and the nut is easily distinguished from any other variety. The shell is rather hard, medium thick, heavy and very well sealed. The meat is white, plump and easily extracted after cracking, averaging 45 to 50 per cent of total weight. While the shell is extra heavy, the flavor is very good. The growth is extremely vigorous and rapid, making a large tree with heavy and abundant foliage, and has a charteristic of growing its nuts in and under the leaves, thus protecting them from the sun. In first looking at a tree it would seem a poor bearer, but when you get under the tree and look up through the foliage you will find it heavily loaded. This tree comes out in the spring, about the same time as the Mayette, the buds beginning to swell about April 10th. It harvests its nuts early in the fall, before the Mayette and considerably earlier than the Franquette. It is an early and heavy bearer, surpassing all other varieties in this respect. During my observations it was the most blight resisting of any of the walnuts, not only because it comes out late in the spring, but I presume on account of its extreme vigor it actually resists the blight. The Eureka has scarcely a touch of blight. I do not believe there is any variety of walnut that is not touched lightly by it under the blight conditions. While the late-blooming varieties are resistant in dry localities, in moist districts and under poor soil conditions they are sometimes touched. The Eureka is naturally free from perforation, probably on account of its strong shell. It is also free from sunburn on account of its abundant foliage and thick husk, as well as bearing the nuts under and among its foliage. It comes nearer to filling the requirements of an ideal walnut than any of the other varieties. It should, however, be grown on heavy soil with good moisture conditions. As the tree is such a vigorous grower and heavy bearer, without sufficient moisture and nutrition it would be impossible for the tree to be sustained and produce large crops of number one nuts.

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When you work in the rain wear the

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REFLEX SLICKER

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Drills through any formation. Five years ahead of any other. Has record of drilling 130 feet and driving casing in 9 hours. Another record where 70 feet was drilled on 2½ gal. distillate at 9c per gal. One man can operate. Electrically equipped for running nights. Fishing job. Engine ignition. Catalogue W8.
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prevent damage to eggs, garden truck, fruits or live stock on road to market. Make any wagon a spring wagon. Soon save cost—produce brings bigger prices—wagon lasts longer—horses benefited. Thousands in use. "My wagon rides like auto" says one user.

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MARVELOUS "K" Hand Power STUMP PULLER

(Hand machine sketched from photo.)

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Three machines in one. Pulling power 48 tons---with two blocks even woman can outpull 8 horses on straight pull. "K" used by Government in Alaska; great success with giant Northwest fir and cedar stumps; also pine, eucalyptis, oak. Weight 171 lbs. Krupp steel; waterproof English cable. Write for special advertising offer and book on land clearing.

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Strictly Cash—One Price to All

WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

The leading varieties for Southern California are the Placentia, Neff's Prolific, El Monte and Ware's Prolific. For Central and Northern California the Eureka is undoubtedly, all things considered, the best variety on heavy soil with good moisture conditions. Then come Mayette, Franquette and Concord. These being better on the lighter soils than the Eureka.

Hogs in the Orchard

By Kenneth C. Miller, Sheridan, Oregon

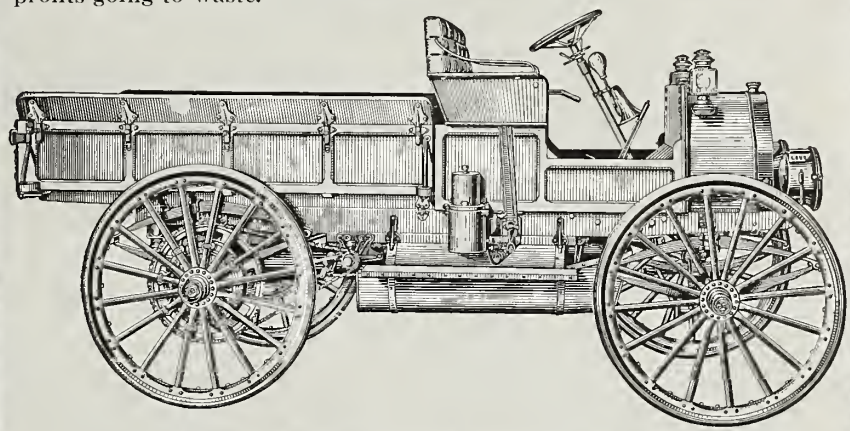
OREGON'S mild winter climate, which allows the vetches, rape, turnips and other suitable orchard cover crops to produce such an abundant growth, also allows the hog to feed and grow without having his feed frozen or covered by snow for any length of time. For the past several years we have grown cover crops and raised hogs in our young 65-acre orchard, situated on the rolling hills at Sheridan, Yamhill County, Oregon. These crops were originally intended merely to replenish the soil, which had been "grained to death." The type of soil is the deep red hill soil, common in that section of the Willamette Valley.

Our starting to raise hogs in the orchard was rather an accident and began in this way: We first commenced to raise common vetch to replenish the nitrogen in the soil, and, in the spring, having bought a prolific old brood sow, there was no place for the pigs to run that winter except in the orchard. The year-old pigs taken from this vetch crop in the spring and fed for ten days averaged 225 pounds in weight; and the pigs, in the meantime, had increased from one brood sow to forty-two pigs in all. After having used vetch for three seasons and obtained an enormous tree growth, we decided to try some potash producers and sowed rape, cowhorn turnips and yellow Aberdeen turnips, also sowing some pieces to common vetch and hairy vetch.

The preference of the hogs for the various feeds was quite interesting. They kept the common vetch cropped very closely at all times and did not touch the hairy vetch at all. Next in preference to the common vetch was the yellow Aberdeen turnips. They ate all of them before touching the cowhorn turnips, which came next in preference. After cleaning up the cowhorn turnips they took to the rape, but always keeping the common vetch closely cropped down and never touching the hairy vetch. Of course they would undoubtedly do well on any of these feeds, but their lines of preference for the different feeds were very decidedly marked. It would seem that hairy vetch would be eliminated in this climate, as common vetch does so well and can be bought here for two to three cents per pound in the fall, whereas the hairy vetch costs us sixteen cents per pound. However, the same number of pounds of hairy vetch will seed more ground than the common, as the hairy vetch seed is much smaller. The yel-

Use An International Motor Truck

Many an up-to-date successful fruit grower will tell you that we are justified in saying this: Wherever fruit growing is a business, and produce is still handled by horse and wagon, there are respectable fruit profits going to waste.



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saves and makes money for thousands of firms in practically all lines of business. Your business deals in perishables that require timely, rapid, perhaps long-distance hauling.

Buy an International and be ready for your daily hauling problems and for emergency trips. The International is simple, sturdy, easy to operate. It is always ready to go, rain or shine, day or night, in all seasons on all roads. It does the work of three or four horse-and-wagon rigs, goes three or four times as fast as one. When it is not in use it puts you to no expense, and when you want it the International will be ready for you.

Our catalogue will tell you of many such features as these: Solid puncture-proof tires; simple, accessible, powerful motor; single lever control; wheels high enough for good traction and ample road clearance; any style of body, etc. If better business interests you write us for more information.

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WE MAKE 200 DIFFERENT SIZES, SUITABLE FOR EVERY PURPOSE

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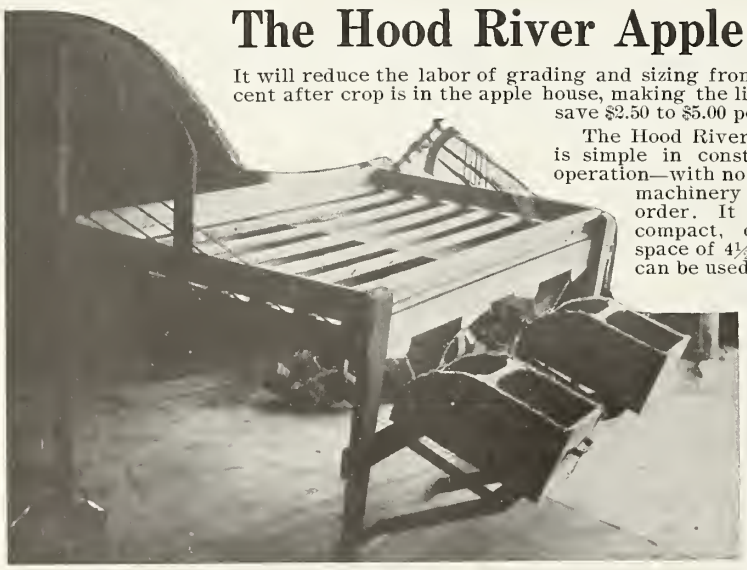
The Hood River Apple Sizer

Apple buyers and consumers are demanding standardization and uniformity in the grading and sizing of apples. This work is usually done by hand, costing from five to fifteen cents per box. The apple industry demands economy in every phase of the business. Consequently an apple grower in Hood River has invented

The Hood River Apple Sizer



It will reduce the labor of grading and sizing from 20 to 30 per cent after crop is in the apple house, making the little machine save $2.50 to $5.00 per day.

The Hood River Apple Sizer is simple in construction and operation—with no complicated machinery to get out of order. It is small and compact, occupying a space of 4½x6 feet so it can be used in any packing house, no matter how small. With extra help it has a capacity of 500 boxes per day and the cost of grading and sizing can be done for 3c per box. The price is so low that every grower, no matter how small, cannot afford to be without it. ANY GROWER WITH A 1,000 BOX CROP CAN SAVE THE COST OF THE MACHINE IN ONE YEAR.

FOR PARTICULARS AND PRICES WRITE TO

J. F. VOLSTORFF, Hood River, Oregon

low Aberdeen and cowhorn turnips do equally well as to growth.

The number of hogs per acre that you could run depends upon how your crop is handled, whether you irrigate or not and numerous other conditions. We have sown our cover crops from July 1 to September 1, putting them in with a grain drill so they will then get moisture enough to come up at once. This gives us plenty of fall pasture for the spring pigs. We have the sows farrow in the spring and carry them and the young pigs on summer pasture. We find it essential to have a quick maturing type of pure bred stock. Pure bred because you get the proper type of a market hog, which brings you more money per pound and also because they put on more fat with more ease, giving you more per bushel for your grain when finishing. We feed no grain except for finishing off. For feeding grain, your hogs must have the proper age. You cannot lay too much stress on type and age. Whenever we have finished plowing under the cover crop in the spring, we then put the hogs in to fatten. They always come off in fine shape to fatten and sometimes hogs of sufficient size are ready to sell without any grain feed; but it is no trouble at all to put on an average of over two pounds per day per hog by feeding ground wheat. We have had hogs, of selected type and age, actually put on four pounds a day. Our buyers like the fat hog to weigh from 175 to 225 pounds and will cut the price on you if they weigh over 250 pounds. Also, in order to get the best prices, you must have the hogs fat before the early summer slump comes in the market price, which is usually about the time clover hogs come off in June.

After having conducted several feeding experiments as to the value of feeding wheat, we have found that the wheat will bring from as low as 85 cents per bushel to $1.47 per bushel. This will vary a great deal, according to your type and age of hog. On the average, though, your wheat will bring you better than a dollar per bushel. Other grain feeds, though, might be cheaper in some localities, but we use wheat because we raise our own. Of course, the amount you can pay for your grain depends also on how much you get per pound for your fat hogs. On a bunch of mixed hogs, recently fattened, many of which were of inferior type and too young, we obtained 86 cents per bushel for our wheat, the hogs selling at 7½ cents. This was just about the price the buyers would pay for wheat at this point. Selected types of hogs, though, did much better, in that they put on more fat for the amount of grain they ate and brought a higher market price, due to their type.

This is just one of the many ways to make the orchard help pay for itself. Although we have run hogs in our orchard for several years, we have never yet had them seriously injure a tree. They will rub against the trees a good deal, sometimes breaking a small limb, but they have never rooted them

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EVAPORATED APPLES
Made from Choice Hood River Apples
If your jobber cannot supply you send your order to
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The Question of the Day
With the fruit grower is, how can he derive a revenue from his overripe and unsalable fruits?
It can be done. It is being done. How? By the use of the new and up-to-date process of
DEHYDRATING
Which is the cheapest, quickest and best process ever devised for preserving fruit without changing the taste or flavor; is clean and sanitary. There is always a market for this product. Can be operated by anyone. Capacity to meet all requirements.
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You want to save time, temper, trouble and trees. You want to raise fruit that brings the highest prices. You want to know all about our sprayer before you buy. There is more you ought to know. Do You Want To Know The Price?
Write for Catalogue 86
REIERSON MACHINERY CO.
Manufacturers 182 Morrison St., Portland, Ore.

out or eaten the roots. There was, however, always an abundanee of feed. We find they will eat the tender young shoots in the spring if left in the orchard after the eover erop has been turned under. Of course they would eat the apples from low-headed trees if put in the orchard too early in the fall. Then, too, they will paek the ground in many places, espeeially in winters like the past one, when we had no freezes to loosen the ground. This requires great eare to plow at the right time or your ground will be cloddy. Generally it will require more work to get your ground in the same eondition than it would had the hogs not been pastured. However, when you poeket the returns from a niee, smooth buneh of fat hogs you will not be able to see that your orchard has been harmed in the least; but you will be able to see the benefits to your trees from your eover erop, and also a niee profit from your hog raising, whieh was accomplished without extra help and with very little extra labor on your part.

Fine Table Syrup from Apples

(U. S. Department of Agriculture)

FOLLOWING extensive experiments begun last spring, the head of the fruit and vegetable utilization laboratory of the Department of Agrieulture has applied for a public service patent eovering the making of a new form of table syrup from apple juice. This patent will make the discovery, whieh the specialists believe will be of great value to all apple growers as a means of utilizing their eulls and exeess apples, eommon property of any eider mill in the United States which wishes to manufacture and sell apple cider syrup.

The new syrup, one gallon of which is made from seven gallons of ordinary eider, is a elear ruby or amber eolored syrup of about the eonsisteney of cane syrup and maple syrup. Properly sterilized and put in sealed tins or bottles, it will keep indefinitely, and after being opened will keep under household eonditions as well as other syrups. It has a distinet fruity aroma and special flavor of its own, whieh is deseribed as being praetically the same as the taste of the syrupy substance which exudes from a baked apple. The syrup ean be used like maple or other syrups for griddle eakes, cereals, household eookery and as flavoring in desserts. The government cooking experts are at present experimenting with it in eookery and expect shortly to issue reeipes for use of the new syrup in old ways and for taking advantage of its speeial flavor in novel dishes.

The department chemists have already produced over ten gallons of this syrup in their laboratories, using summer and other forms of apples. The suceess of the experiments has greatly iuterested some of the apple growers, and during Oetober a large eider mill in the Hood River Valley, Oregon, will, in co-operation with the government ehemists,

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Call or write for details of our system that saves you the retailer's and plumber's profits on all your plumbing supplies, pipes and fittings. Money-back guarantee of complete satisfaction. Estimates free.
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THE BEST OF
ORCHARD AND GARDEN TOOLS
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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

The Orchard Heater that Lights Itself

Announcement to Fruit Growers

It Lights Itself

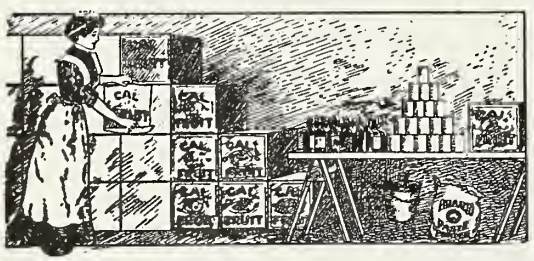
After many years of experimenting, we have succeeded in perfecting, and are now able to offer to the FRUIT GROWER, our **AUTOMATIC ANTI-FROST STOVE**; the Best and Cheapest Insurance against damage by Frost to trees in bloom or setting fruit. The **AUTOMATIC ANTI-FROST STOVE** is the **ONLY SELF-LIGHTING** and **OPERATING** ORCHARD HEATER in the world.

Send for Catalogue and Price List

The Anti-Frost Stove Co.

621 Main Street, CINCINNATI, OHIO

Paste for Labeling—"Palo Alto" Paste Powder



added to cold water, instantly makes a beautiful, smooth, white paste. Ready for immediate use at a cost of ten cents a gallon. No labor. No muss. No spoiled paste.

Paste Specialists

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Box Apples a Specialty

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WE MAKE A SPECIALTY OF

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FOR

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Fine Printing **Portland, Oregon**

endeavor to produce 1,000 gallons on a commercial scale and give the new product a thorough market test by making it accessible through retailers in a limited field. The interest of apple growers in the product arises from the fact that the new apple cider syrup promises to give them a commercial outlet for vast quantities of windfall and other apples for which they hitherto could find no market either in perishable raw cider or in vinegar. Cider production, it seems, comes largely at one season of the year, during which the market is more or less flooded with this perishable product. The bulk and perishability of the raw cider, moreover, the cider makers state, often make it unprofitable for them to ship the raw cider of one district long distances to a non-apple-growing region. The market for cider, therefore, has been largely restricted in many cases to localities near the area of production. No method of sterilizing ordinary cider has been found practicable, for the reason that boiling cider at once interferes with its delicate flavor.

With the cider mill able to make a palatable, long-keeping table syrup out of its apple juice, growers, it is believed, will be able to use all excess juice for bottled or canned apple syrup. The new syrup, the specialists find, will keep indefinitely, so that the cider makers can market it gradually throughout the year. The process for making the syrup calls for the addition to a cider mill of a filter press and open kettles or some other concentrating apparatus. The process is described as follows: The raw cider is treated with pure milk of lime until nearly, but not quite, all of the natural malic acids are neutralized. The cider is then heated to boiling and filtered through a filter press, an essential feature of the process. The resultant liquid is then evaporated either in continuous evaporators or open kettles, just as ordinary cane or sorghum syrup is treated. It is then cooled and allowed to stand for a short time, which causes the lime and acids to form small crystals of calcium malate. The syrup is then refiltered through the filter press, which removes the crystals of calcium malate and leaves a syrup with practically the same basic composition as ordinary cane syrup. Its flavor, however, and appearance are distinctive. Calcium malate, the by-product, is a substance used in medicine and is at present selling for two dollars a pound. It is believed that if calcium malate can be produced in this way cheaply and in large quantities, it can be made commercially useful in new ways, possibly in the manufacture of baking powder.

List of Fairs, Apple Shows and Expositions for 1914

New Westminster, B. C., September 28-October 3.

Utah State Fair, Salt Lake, October 5-12.

Fifth Annual Apple Show, San Francisco, October 1-11.

Manufacturers' Land and Product Show, Portland, October 26-November 14.

Sixth National Apple Show, Spokane, Washington, November 16-21.

Hard times cannot be cried down by shouting, but they can be beaten down and driven off by everyone lending a helping hand and showing the way over from the dark side to the bright side.

Remember that every dollar this country had a year ago or five years ago it has today. We have not been drained of our resources. Our factories have not been burned down, our young men have not been killed in tens of thousands, we have not lost thousands of millions in trade, but on the contrary shall gain trade. All we need is to attend to our business, produce, sell, buy of each other, stop pessimistic talk and we shall have all the prosperity we want and possibly more than we deserve.

STEINHARDT & KELLY

Herewith Proclaim Their Unshaken Faith in the American Apple

The 1914 crop of apples is being harvested under conditions that have no parallel in the past. There has probably never been a larger crop, our export outlets have been blocked, money is at unheard-of premiums, if obtainable at all, the growers and the trade are all at sea.

Nevertheless **STEINHARDT & KELLY** are placing contracts for choice blocks of Western box apples from the famous growing districts. They have contracted for approximately

650 CARS

already and are steadily buying more for storage.

Apples will be paying property this year as in the past. Nothing but lack of confidence makes the 1914 situation different from that in other years.

STEINHARDT & KELLY have been handicapped by as much uncertainty as anybody else, but now, after a careful study of conditions and prospects they are carrying out a conservative but confident policy and take this method of publishing their confidence for the encouragement of the apple trade and apple industry.

The crop now being harvested represents eight to ten months of anxious work by the producers of fine apples. Without distribution growers cannot continue to produce. It is now the duty of the trade to back the growers loyally. Old antagonisms must be dropped on all sides, old fallacies about the "superfluous middleman" must also be forgotten and the foundations laid for a bigger and a more glorious future.

Whether we handle box, barrel or bulk apples it is our duty as distributors to back up our fellow Americans who produce this fruit in which we all have vital and permanent interests. Let us talk less of difficulties and more of the possibilities. The Export outlook may be dark now, yet without exports of any sort we could still consume the whole crop at home at a profit to all concerned. Where there is a will there is a way!

STEINHARDT & KELLY cannot buy all the apples in the United States, but they can buy quantities in keeping with their supplies of past years, and are doing so, and they can and are placing contracts judiciously to sustain and compensate those growers in all the famous districts who have worked hardest to establish and maintain the highest standards in quality, goods and pack.

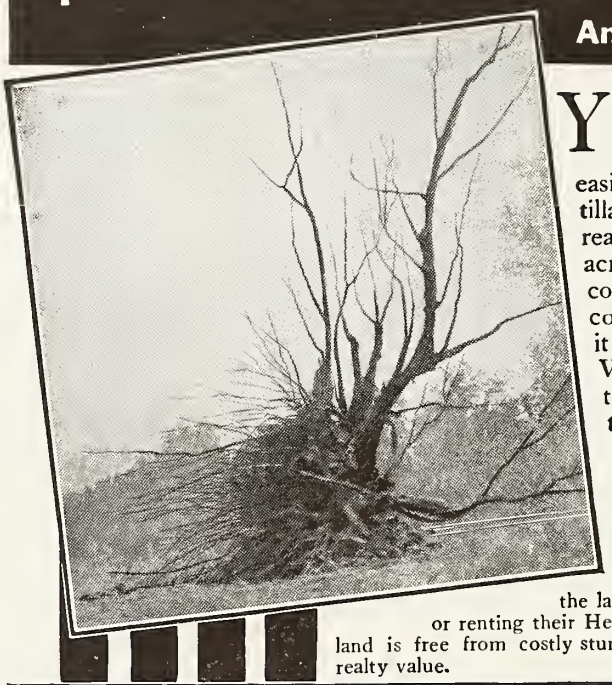
Everybody Must Help

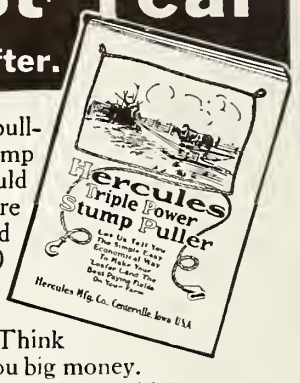
Let us all work together towards a constructive end! The 1914 apple deal may be no different from that of other years; it merely looks a little different now.

Buy apples! Buy good apples! Handle them skilfully, work to stimulate consumption, let them go at prices that will encourage use and give everybody a sure but moderate profit. If you do this the 1914 apple deal will eventually be a paying proposition for everybody concerned, grower, trade and public.

Your 40 Acres of Stump Land Can Be Turned Into a Profit of $1281.00 The Very First Year

And $750 Every Year After.

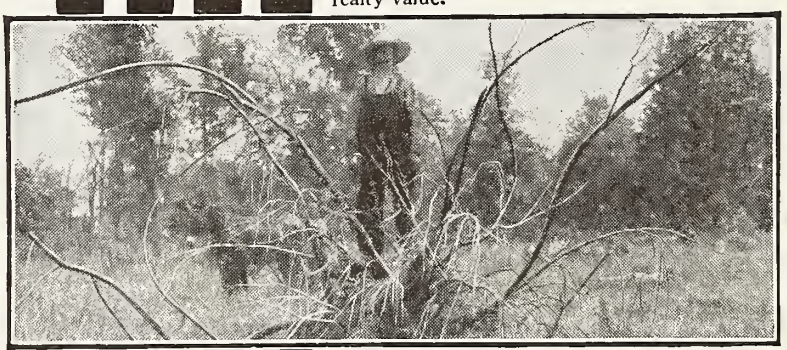




YOU can double the land value by pulling out the stumps. If your stump land is worth $20 an acre—it would easily be worth $40 an acre if it were tillable. On 40 acres the increased realty value would be $800. On 40 acres of cleared land—*virgin soil*, you could easily raise 1500 bushels of corn—at 50c per bushel—$750. Think it over Mr. Farmer. Stumps cost you big money. With land values going up—and crop prices as high as they are—you *can't afford* to keep on paying taxes for land that doesn't bring in a cent.

This Free Book Proves It

Read how thousands of other progressive men have pulled out stumps on their land instead of buying new lands. They've taken advantage of the virgin soil that the stumps keep away from cultivation. They've paid for their stump puller over and over again the first year with the profits from the extra crops and increased value of the land. And now they're doing contract stump pulling for their neighbors or renting their Hercules Stump Puller at a nice profit. But the main thing is, their own land is free from costly stumps—they farm all their land—and all their acres are at top-notch realty value.

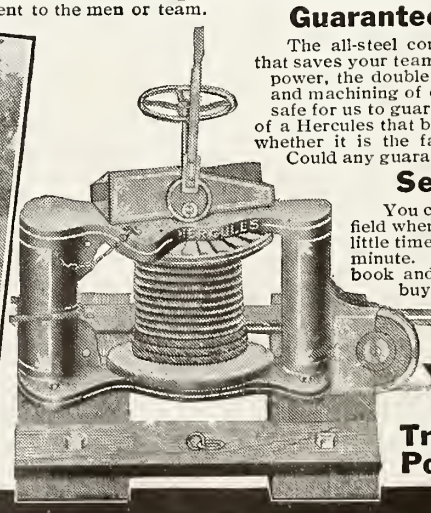


HERCULES

All Steel, Triple Power Stump Puller

It will pull up any size stump, green tree or hedge in five minutes. It will clear an acre or more of stumps a day.

I want you to bear in mind that the Hercules is the only Triple Power, All Steel Stump Puller made; that it can be changed from triple to double or single power in a moment's time without trouble; that it is the only stump-puller having all the working parts machined and finished to reduce friction—hence the lightest draft machine. I want you to remember that the Hercules is 60 per cent lighter and 400 per cent stronger than cast iron or the so called semi-steel or new process steel which are catchy phrases now-a-days used to describe cast iron pullers; that you can clear almost three acres without moving the Hercules that the double safety ratchets absolutely prevent accident to the men or team.



Guaranteed for Three Years

The all-steel construction, the triple power feature that saves your team and gives a tremendous increase of power, the double safety ratchets and careful turning and machining of every part—all these things make it safe for us to guarantee the replacement of any casting of a Hercules that breaks at any time within three years, whether it is the fault of the machine or your fault. Could any guarantee be fairer or stronger?

Send In Your Name

You cannot afford to have stumps in your field when it is so easy, so cheap and takes so little time to pull them out. Don't wait another minute. Mail me a postal at once for my fine book and my low introductory offer to first buyers. Address me personally.

B. A. FULLER, Pres.

Hercules Mfg. Co.

869 23rd Street

Centerville

Iowa

Triple Power